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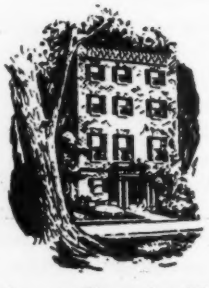
The Cover

Clarence R. Wolf is noted for the cheerful Christmas cards he makes up each year. The Christmasy basket of holly shown on this month's cover is one of his efforts and when the National Horticultural Magazine saw it some months ago they decided it was just the cover needed for their 194-page special issue—*A Handbook on Hollies.* This special issue represents the last word on this interesting subject. It includes a history of holly, the varieties found in this country and elsewhere and directions on how to make attractive floral displays. If members would like to know more about this subject or obtain copies of the handbook they should write to James R. Harlow, The American Horticultural Society, 1600 Bladensburg Road NE, Washington 2, D. C.



The AFA

The American Forestry Association, publishers of *American Forests,* is a national organization—independent and non-political in character—for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and the part they play in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

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Reading about RESOURCES

By MONROE BUSH

THE rarest, most priceless books in the world are seldom found in the sealed cabinets of so-called rare book collections. You are more apt to discover them, worn and dirty, scattered through the private shelves of those creative men who build and buttress civilization. For these most rare and priceless of all books are the few which have shaped great lives. They are the books which have rescued men from little dreams, and sent them out to be our leaders.

Believing that you would want to know something of the impact of such books on the foremost conservationists of our time, I have asked a few of the most distinguished for "a statement . . . on the book or books which have had the most significant influence on your life and work as a conservationist. This," I suggested, "would reflect your personal experience with a book, not necessarily being an indication of its objective merit."

The unedited, uncut replies which follow will doubtless take a permanent place in the very human history of the great conservation movement in the United States:

HUGH H. BENNETT, *formerly Chief, Soil Conservation Service, U. S. Dept. of Agriculture.*

Mr. Bennett

"My principal interest in conservation came more from what I saw on the eroded farmlands of America than anything else. During my earlier work in the old Bureau of Soils meaningful books on soil erosion and soil conservation were either nonexistent or not available. George Marsh had written the classic, *The Earth as Modified by Human Action,* but it received little attention. A few geologists had pointed to the seriousness of erosion but their warnings were hidden in ponderous annual reports.

"People were not interested; they had little understanding of the subject. Almost nothing was being done.

"My first real understanding of the problem came from field observations while making a soil survey of Louisa County, Virginia, in 1905. This information, together with subsequent observations elsewhere, aroused my deep interest. It was the Governors' Conference in the White House in 1908, however, that developed the desire to pursue the subject. Specifically, it was T. C. Chamberlain's paper, 'Soil Wastage,' that did as much as anything else to influence my subsequent action in the field of soil conservation—the main work of my life."

HENRY CLEPPER, *Executive Secretary, Society of American Foresters.*

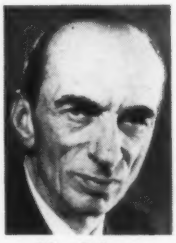
Mr. Clepper

"Henry David Thoreau's third and last venture into the north woods of Maine occurred in the summer of 1857, one hundred years ago. The accounts of his two previous trips, in 1846 and 1853, were published under the titles 'Ktaadn' and 'Chesuncook.' The journal of his last trip did not appear until after his death in '62, and bore the title 'The Allegash and East Branch.'

"In 1950, the publishing house of W. W. Norton & Co. of New York brought out *The Maine Woods,* a book that provides a single account of all three trips. It was arranged by Dudley C. Lunt and delightfully illustrated with drawings by Henry Bugbee Kane.

"Over a period of nearly four decades, these narratives of Thoreau's have been for me the most satisfying of all outdoor literature. When in need of relaxation, inspiration, or general refreshment of the soul, when my faith in conservation needs renewing, I go to *The Maine Woods.*"

FAIRFIELD OSBORN, *President, The Conservation Foundation.*



Mr. Osborn

"I totally agree with the fine idea of this special column in AMERICAN FORESTS to highlight books of significance on conservation. Unfortunately, I find the greatest difficulty in responding as to my choices. The reason for this is that conservation is such a pervasive subject. This being true, I have been influenced, as far as I can analyze it, by all sorts of literature. I suspect that my initial interest in the whole great cause of conservation stemmed from an innate and passionate love of wildlife and of wilderness and the need for their protection. In my boyhood I was captivated by books by Ernest Thompson Seton, John Muir and John Burroughs. I was taken with the idea that man must become a trustee for other living things. This conception broadened and I began to interrogate through historical reading some of the consequences of man's misuse of his environment—of the disappearance of societies such as the Mayans, of the declination of societies in the Mid-East and even of such powerful entities as the early Romans and the Spaniards. In

contrast one could not fail to note the permanency of certain other societies, in Europe for instance, where 'conservation' was ingrained in the culture of the people.

"There are many contemporary fine books—including writings by Aldo Leopold, the Huxleys, Paul Sears, William Vogt, Joseph Wood Krutch, Samuel H. Ordway, Jr., Harrison Brown and others, and a host of capable books on the 'specialties' involved in conservation—forests, soils, water and so forth.

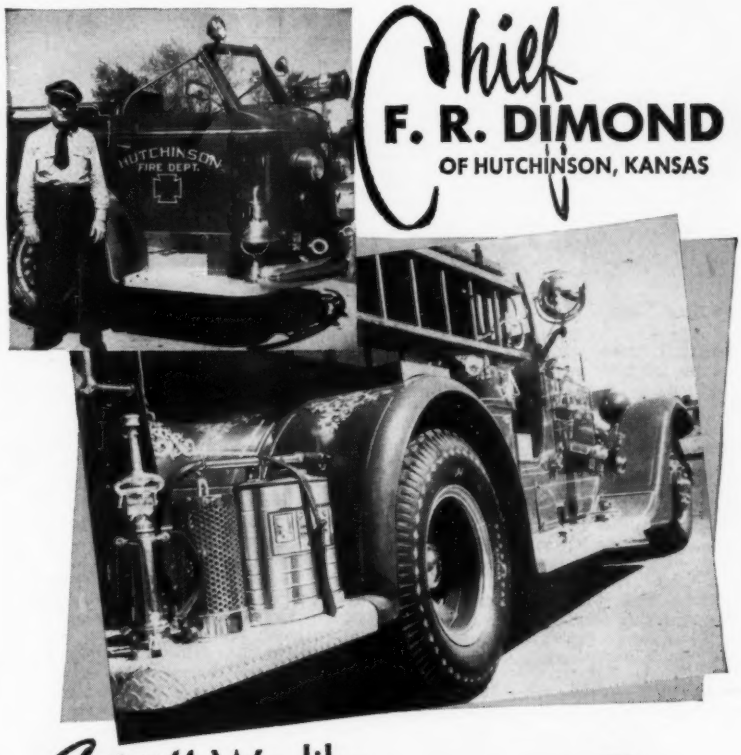
"I can only repeat — 'conservation' is such a pervasive subject, one in which even a philosophical consideration of the meaning of man's life on this earth has a place."

HARLEAN JAMES, *Secretary, American Planning and Civic Association.*

Miss James

"A generation ago when I came into the then American Civic Association and was introduced to organized conservation, I learned that Dr. J. Horace McFarland, president of the four-year-old association, had participated in the famous Conference of Governors called by President Theodore Roosevelt in 1908. I studied one of the 50,000 copies of proceedings covering 450 pages and learned that the conference had been suggested in an address by President Roosevelt before the Society of American Foresters in 1903. The list of the sponsors and participants contains most of the famous men and women of that time. It included the Cabinet, the Supreme Court and most of the Members of Congress. But I found special interest in the three speakers who urged the preservation of natural scenery—Dr. McFarland, Governor Charles Evans Hughes and Dr. George Kunz, president of the American Scenic and Historic Preservation Society. Dr. McFarland, later joining forces with Frederick Law Olmstead, Stephen T. Mather and Horace M. Albright, led the movement to create a Federal National Park Agency, and in 1916 Congress passed a law creating the National Park Service which, with the U. S. Forest Service, and what is now the Fish and Wildlife Service, administers federal areas for the benefit of the people.

(*Turn to page* 34)



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Forest Forum

Coon Valley Saga

EDITOR:

This letter is being written to express my appreciation for your article "Coon Valley Saga" written by Lewis C. French, and appearing in the October 1957 issue of AMERICAN FORESTS.

This article points up a matter that has been of concern to foresters with respect to the development of small watershed projects under the Watershed Protection and Flood Prevention Act of 1954. There has appeared to be a tendency at times to stress the structural aspects of the program with relatively minor emphasis upon the role that forested lands within the watersheds play in minimizing flood flows, and reducing the movement of sediment into the stream channels and detention reservoirs. Mr. French's article clearly points out the penalty that has been paid in the Coon Valley watershed as a result of the failure to put the woodlands of that watershed under good forest management principally through the exclusion of livestock grazing from the woods.

I also thoroughly agree with Mr. French's observation that the job to be done is far too big to warrant indulgence in jurisdictional questions that may retard the accomplishment of necessary conservation work. The wholehearted efforts and resources of all public conservation agencies are required whether they be local, state or federal. The total resources available to get the needed work done are small in relation to the magnitude of the task. In this connection it is my understanding that the state foresters have been encouraged to enter into agreements with the Soil Conservation Districts and the watershed associations to provide needed technical forestry services to the landowners and to the Soil Conservation Districts.

The state foresters have a very real role to fill in aiding Soil Conservation Districts and watershed project sponsors in planning and installing the forestry phases of watershed protection and flood prevention projects. It is my opinion that foresters, and especially the foresters in the state forestry organizations, can make a valuable and badly needed contribution to the watershed programs. The foresters, however, require the 100 percent cooperation of folks in other agencies such as the county agents, the Soil Conservation Service technicians and the state agricultural experiment stations.

Mr. French's article is very timely and warrants the careful consideration by all foresters responsible for planning and administering the forestry phases of the small watershed project programs. Again, let me thank you for the good job that you did in having this article by Mr. French printed in AMERICAN FORESTS. I am sure the article will be very helpful in calling attention to the need for more forestry in the watershed protection and flood prevention program.

Warren T. Murphy
6207 - Crathie Lane
Washington 16, D. C.

Insects and Disease

EDITOR:

In response to the editorial call for forest insect information carried in the August issue, we would like to contribute some general information regarding a forest insect infestation which has affected our forestry program.

For many years, the forest tent caterpillar has been defoliating aspen stands in the area to the west, the north, and the east to Lake Superior. About 1952, this infestation began to spread into Wisconsin from the northwest corner of the state, and by 1953, it had covered the Bad River Indian Reservation area near Ashland, Wisconsin, in which area this company owns many thousands of acres of forest land.

Since the forest tent caterpillar was in the habit of building up to a peak and dying out in a period of three to four years, no one was too deeply concerned about this infestation, and no control measures were exercised. For some reason, however, this infestation was somewhat different from the usual, in that it built up very rapidly to a heavy classification in 1954 and has continued at that stage through 1957. The results of these repeated complete defoliations are now becoming apparent.

Previous infestations of the forest tent caterpillar had been confined to areas where the aspen was in heavy supply and where it had relatively low value at the time. However, aspen in Wisconsin is an important pulpwood species; over a half million cords being produced, and three-quarters of a million cords being consumed within the state in 1956.

To begin with, the tent caterpillar seriously interferred with the sap-peeling of aspen pulpwood. By the middle of the peeling season, all of the aspen trees in the area were completely defoliated, and with this reduction in transpiration, the cambium layer lost its fluid characteristics and peeling stopped near the end of June. To those people whose principal living is dependent upon the production of pulpwood, this was a serious situation.

About halfway through each growing season, the trees were completely defoliated and growth undoubtedly ceased. Although this does not appear to be very costly, if we assume that this aspen is growing at the rate of one-fourth cord per acre per year and that the stumpage is worth $2.00 per cord for easy figuring, the loss of half the annual growth amounts to 25 cents per acre per year. Although this does not seem to be a very large loss, it amounts to $2500 annually on 10,000 acres of aspen land. Actually, the growth rate in better stands is probably above one-quarter cord per acre per year and therefore the loss in these better stands would be in excess of these figures.

This reduction in growth is a direct loss and, in the five years of infestation has probably amounted to well over $1.00 per acre.

After five years of repeated infestations, mortality is becoming apparent. In areas logged this year, an average of perhaps one-half cord per acre of dead trees is being left standing. These trees have without doubt been killed directly or indirectly by the forest tent caterpillar. This amounts to an additional loss of $1.00 per acre in stumpage since, presumably, these trees would have been harvested had they been alive at the time of logging.

One of the indirect effects of this infestation is that these trees have now become susceptible to other forms of damage, particularly tree diseases. Repeated defoliations reduce the vigor of the aspen stands and make the less vigorous trees susceptible to other enemies.

Another indirect result of this defoliation is the tremendous increase in growth of understory brush. The heavy shade cast by a high, dense stand of aspen generally keeps all species of understory brush in check. However, with the removal of the leaves from the aspen trees, sunlight reaches the ground and the brush is able to grow vigorously and to take over the site. Natural brush control, exercised by the canopy of aspen tops in the past will now have to be replaced by some applied control measure and substantial costs will be involved.

In a few areas, where good stands of understory conifers are present, the defoliation of the aspen will probably have a beneficial effect upon the growth of the conifers. However, the area in question is predominantly pure aspen and understory conifers are the exception.

Other minor, indirect results of this infestation include slippery highways in limited areas from the numerous caterpillars traveling across the pavement and the nuisance that these insects offer to woods workers by their tremendous numbers.

Generally, the forest tent caterpillar has been considered an insect of minor importance. However, when all of the direct and indirect effects of the infestation are taken into consideration, this insect becomes rather important.

Ward Smith
Woodlands Superintendent
Rhinelander Paper Co.
Rhinelander, Wisconsin

(Editor's Note — *American Forests* is greatly indebted to the many, many people who have written in response to our call for their views on insect and disease problems. Some of these views will be presented in future issues as we continue to explore these problems together.)

By ALBERT G. HALL

THE APPEARANCE OF SPUTNIK I AND SPUTNIK II and the promise of more to come, the somewhat frantic realization that the Free World is a bit behind, publicly at least, in the guided missile race, and the increasing pressures for increased effective military preparedness, all may have profound effect on the budgets now being prepared for Fiscal Year 1959. The President has indicated that defense increases must be offset by economies in other directions, and that "savings of the kind we need can come about only through cutting out or deferring entire categories of activities." To continue non-defense spending at current rates and to add accelerated defense spending to the budget will mean one of two courses for the federal government: Increased taxes or increased borrowing, or possibly a combination of both. In an election year, increased taxes might be asking for political fatalities. Increased borrowing will mean further devaluation of the currency. Federal spending programs, backed by powerful lobbies, will be politically difficult to curtail. This is the dilemma facing the Administration budgeteers, the statesmen, and the politicians. How much the non-defense economy wave will affect expenditures for forestry and related conservation measures is not yet evident. It can be expected, however, that all but the most vital programs will be given close screening in the departments, by the Bureau of the Budget, and by Congress. There will be renewed efforts to seek greater state responsibility and financing, as opposed to federal financing, of many direct federal and federal-state cooperative programs.

NEW RESTRICTIONS ON OIL AND GAS LEASING ON WILDLIFE LANDS will be the subject of a public hearing December 9 in Washington, D. C. The new proposed regulations would prohibit oil and gas leasing on the 4,418,000 acres of wildlife refuges under the jurisdiction of the Fish and Wildlife Service except where the Geological Survey determines that oil and gas is being drained by operations on adjacent lands, in which case leasing would be permitted only if the wildlife resources would not be damaged thereby. On the 4,616,000 acres of game range lands, administered jointly by Bureau of Land Management and Fish and Wildlife Service, some areas would be closed and others would be open to leasing under the same conditions as apply to wildlife refuges. Policy for the 502,000 acres of federal-state cooperative areas and the 7,885,000 acres within Alaska wildlife areas, would be the same as for game range lands, except that the loss from drainage would be determined by the administering agencies rather than by Geologic Survey. Wildlife organizations appear to be pleased with the proposed regulations, but protests have been received from producers and locators of gas and oil wells, principally the smaller companies, that they would be practically forced out of business. A basic question being asked: If leasing can be permitted when there is a possibility of drainage, why should it not be permitted under other circumstances if wildlife is not damaged thereby?

TRANSFER OF PUBLIC FOREST LANDS TO PRIVATE FOREST OWNERS in exchange for such of the private owners' timberlands as might be flooded out by federal reservoir projects was opposed by Assistant Secretary of Agriculture Ervin L. Peterson in an address given at the annual meeting of National Lumber Manufacturers Association last month. Secretary Peterson said, "The basic question involved here is whether compensation for private property taken for public purposes should be in kind or in cash compensation. To compensate the timberland owner by awarding him

(Turn to next page)

national forest or other federal timber for equivalent timberland taken for public purposes would place him in a very different position than other property owners whose land may be taken for public purposes. . . . We in the Department of Agriculture believe that the policy of compensation other than by traditional methods would not be in the best interests of sound management of the public lands." The Secretary's statement is an indication of what will probably be the department's answer to the House Committee on Government Operations which has asked both the Department of the Interior and the Department of Agriculture to report on the practicability of such exchanges.

SECRETARY PETERSON ALSO TOLD THE LUMBERMEN that his department and particularly the U. S. Forest Service is working toward "the most intensive production of timber and the most intensive utilization that is attainable" in the management of national forests. The target is to offer for sale the full allowable cut on each working circle wherever there are buyers wanting the timber. (Recently the department made available to the Forest Service an additional $370,000 to be used for increasing the number of timber sales in the national forests of Oregon and Washington. This is in addition to $1.9 million previously allocated for timber sales in the Northwest during the current fiscal year. The additional money is expected to make 800 million board feet available for sale.)

A NATIONAL PEST ACTION COMMITTEE was proposed at the annual meeting of National Lumber Manufacturers Association held in Washington, D. C. last month. NLMA's board of directors called upon the Forest Industries Council, the policy coordinating organization of the lumber, paper and pulpwood industries, to establish such a committee to advise public and private agencies on current forest insect and disease problems and to help coordinate public-private programs in this field. Forest pests—insects and diseases, principally—are real but often unspectacular threats to the forest products economy and to the other benefits that are derived from forest cover. In timber volume alone, the Timber Resource Review has estimated that 61 percent of the loss (growth impact) of growing stock is attributable to insects and diseases, compared with 15 percent by fire. In sawtimber volumes insects and diseases account for 65 percent of the annual losses, while fire accounts for 17 percent.

AN ELECTION YEAR SHAKE-UP OF THE FARM PROGRAM appears to be taking shape. The Eighty-Third Congress in its first session almost eliminated the Soil Bank Program before there was a chance to gauge the program as either a failure or a success. Predictions are that a further move will be made to abolish the Agricultural Reserve phases of the Soil Bank, but that the Conservation Reserve phase, under which agricultural acreage is diverted to tree crops, may be retained. As pointed out by John Wilder, president, Tennessee Association of Soil Conservation Districts, in a speech last month, "We have, in most counties in America, actually three conservation programs—all administered by the U. S. Department of Agriculture. Each has its own set of personnel and overhead expenses. There is the Agricultural Conservation Program (ACP) with its rules and handy checks. The Soil Bank Conservation Reserve—heavily endowed with funds for cost-sharing with another set of rules from Washington. And, in the same county, a Soil Conservation District directed by locally elected farmers with technical assistance from usually one (and sometimes two) overworked Soil Conservation Service technicians trying to serve the ACP, the Soil Bank, and—if he has any time left, he can work on the District's program. This makes district work programs and district plans hollow shells. It keeps the technicians rushing about in order that the ACP and Soil Bank funds allotted to the county may be used up."

ANY SHIFTING OF EMPHASIS IN THE FEDERAL PROGRAMS will, especially this year, be appraised in terms of political effect more than in terms of real and lasting conservation. The National Association of Soil Conservation Districts, however, has a strong program of applied conservation through the use of federal technicians rather than federal cash subsidies. It is now engaged in the study of questionnaires answered by some 2100 Soil Conservation District Boards. The answers to 27 pertinent questions on each form will provide the NASCD with bases for guidance of its own program and for proposals to the Congress and the administrative agencies.

Editorial — The Man from Holly Hollow

Harry William Dengler, of Holly Hollow, Maryland, loves holly. This sets him a little apart from some of his brothers in the profession of forestry who do not altogether share the Marylander's fondness for *Ilex opaca* and between 20 and 30 other evergreen and deciduous holly species native to North America. When holly takes hold, it doesn't just grow. It gallops. In the past it has galloped merrily and colorfully into test plots and other areas where foresters had been endeavoring to grow some superior species of tree for commercial purposes. Once in, holly certainly livens up the place but not infrequently the hoped-for superior species is smothered in the process. As foresters have learned, holly is very neighborly and is always dropping in.

And lots of people both in America and around the world like it that way, Mr. Dengler adds. He would agree perfectly with the speaker at the recent convention of The American Forestry Association who said that whoever it was coined the word *weed species* as applied to some trees did forestry a grave disservice. Holly is no weed to Harry Dengler. Nor is it to millions of people all over the world some of whom regard Holly Hollow as a sort of unofficial world capital of holly. Mr. Dengler has a prodigious correspondence with people living in foreign countries who all share one thing in common — love of holly.

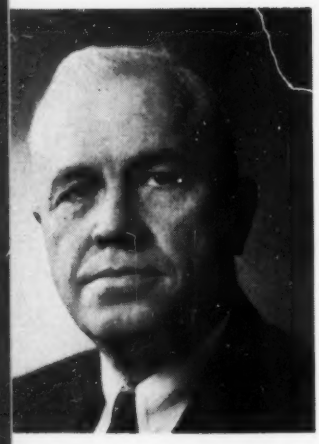
"How useful is holly?" some people have asked. How does one measure the usefulness of expressions of friendship or the light in the eyes of a hospitalized patient when a friend hands her a sprig of holly at Christmas time, Mr. Dengler replies. Incidentally, Mr. Dengler is always giving holly to people and not just at Christmas time — all the time. When Mrs. Franklin D. Roosevelt made her first return visit to Washington after her husband's death it occurred to Mr. Dengler that it would be a lonely experience for her in many ways. And while he had never met her before, her arrival found him on hand with a special spray of holly. Did she like it? According to people who were there, her eyes lit up like the National Christmas Tree right in the middle of July. Holly has been doing that to people for centuries, Mr. Dengler says. To which he adds, of course it's useful.

Just how important and useful generations of people have regarded holly throughout the ages, Mr. Dengler had an opportunity to determine when he recently took on the job of guest editing the handsome new *Handbook of Hollies* published by the National Horticultural Magazine. For Mr. Dengler and Managing Editor James R. Harlow, this handbook was a labor of love and it will be *the* standard work on the subject for many years to come. In producing the book, Mr. Dengler probed into the folklore and legends surrounding holly and produced a gold mine of interesting information. The Druids, for instance, believed the sun never deserted the holly tree and to them it was a sacred plant. For centuries, people all over the world have regarded the holly tree as sacred, a symbol of friendship, and a provider of medicines and tonics. To the Greeks, mistletoe implied the ability to overcome difficulties and holly stood for foresight. A bouquet of the two presented to a friend carried the symbolistic message, "By foresight you will surmount your difficulties." To the ancients, holly also symbolized "Defense" and Pliny the Elder wrote that a holly tree planted around the house served to ward off evil spirits. Eastern North American Indians planted holly for the identical reason.

How could different races of people living thousands of miles apart in different eras with no recourse either by language or travel have arrived at the same mystic beliefs regarding a single tree? Who knows, says Mr. Dengler. There have been wise people in every era who, without knowing why, have sensed that certain things have a great purpose that are ordained to be, if not in one era then perhaps in the next or the next.

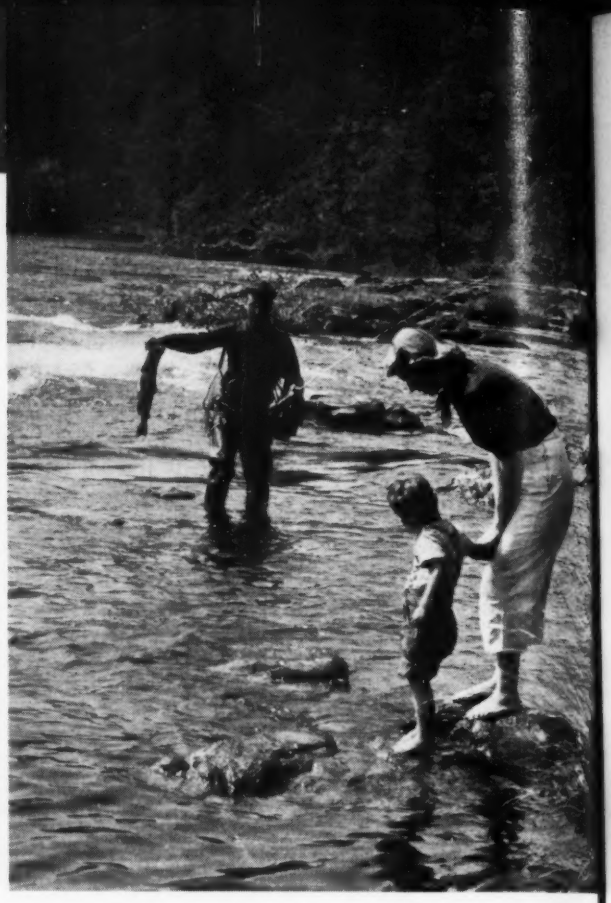
Mr. Dengler estimates there are between three and five hundred plants in the *Ilex* species of holly alone throughout the world of which North America has between 20 and 30. Mr. Dengler suggests that horticulturalists not be too hasty in importing exotics. He urges that we first experiment with those plants we already have. These natives are described in detail in a section that reads not unlike a racing form. For instance: "Monty — a fast growing female of compact growth. . . . Mrs. D. D. Hunter — a female of good foliage, bright red berries, considered excellent selection in the South. . . . Knight — a very straight female of distinct upright habit." . . . and so on. As Mr. Dengler comments, "Plant ecology is an intriguing science involving many factors. . . ."

Finally, holly is a cheerful symbol of Christmas and a very integral part of the warm glow that attends the holiday season. William Turner, an English writer, wrote in 1568 that the word holly is believed to be a corruption of the word "holy," although historians differ on the point. It is known that in Italy, sprigs of holly were used in decorating mangers at Christmas time. All these things are described in a book that is as cheerful as Christmas itself (see our cover) by Harry William Dengler, the man from Holly Hollow. The book is going all over the world and it is making friends for America wherever it goes. And anything that makes friends for America in other parts of the world today is definitely useful.



About the Author

Walter H. Horning is a professional forester, who for many years has been closely associated with the O&C situation. He worked on the technical phases of the Interior Department's legislative campaign which produced the O&C Act of 1937. As the first chief forester of O&C lands, Mr. Horning pioneered the development of sustained yield management on those lands and developed the technical organization to carry it out. Since 1949, he has been staff officer in charge of forestry in the Washington, D. C. office of BLM.



The Oregon Checkerboard---Twenty

By WALTER H. HORNING

THE 2.5 million acres of Oregon and California Railroad Grant Lands in western Oregon have been described as "Oregon's forest checkerboard." A glance at the map confirms the aptness of this description. Roughly 2 million acres of the total is under the jurisdiction of the Department of the Interior and ½ million acres under the jurisdiction of the Department of Agriculture.

In April 1936 *American Forests* published an article referring to these lands as "The Oregon Checkmate" largely because of complaints that owing to their scattered location and the lack of a conservation plan they were preventing the proper management and use of enormous forest resources in nearby areas. Legislation was enacted on August 28, 1937, which provided authority for the Department of the Interior to undertake one of the Nation's most progressive forest management programs on these lands and established sustained yield forest management as a Congressional policy.

One of the objectives of Congress when it was considering the O&C Sustained Yield Act was to establish a sound fiscal policy for what was regarded as an unusual project in public forestry. Congress sought to (1) have the property yield an income to county governments; (2) pay up delinquent tax claims; (3) reimburse the U. S. Treasury for deficits created by acquiring the property and holding it during the years of low income; and (4) make the enterprise self-sustaining so that it need not be a drain on the Treasury of the United States.

In 1937 the O&C fund in the Treasury showed a deficit of approximately 8.7 million dollars and delinquent tax claims amounted to another 2 million dollars. Consequently at the beginning of the management program there were outstanding obligations of 10.7 million dollars. The new management program produced immediate and rapid improvement in this unfavorable financial record. At the end of 1952 those obligations were completely satisfied, income had reimbursed the Treasury for all previous appropriations, and the property had paid for itself.

From income produced by these lands since 1937 the Department of the Interior has distributed 71 million dollars to the counties. Of this total about 61 million dollars came from the area administered by the Bureau of Land Management and the remainder from the portion ad-

ministered by the United States Forest Service. The costs of administration by the Department of the Interior since 1937 amounting to 12½ percent of gross income have been reimbursed to the Treasury from the government's share of receipts from timber sales, which is 25 percent. Since 1951 the Treasury has gained net returns totaling approximately 11.8 million dollars from the portion of the revested lands administered by the Bureau of Land Management.

The 74,000 acres of reconveyed Coos Bay Wagon Road lands are a part of the Oregon checkerboard. They are managed under the same plan as the O and C lands but their income is distributed under a plan which involves the payment of ad valorum taxes to the counties. When the net income of these lands is added to that of the O&C lands the gain to the U. S. Treasury since 1937 totals 26.8 million dollars. This includes the 8.7 million dollar deficit of the Treasury against the O&C lands in 1937, which subsequently was reimbursed, plus the 18.1 million dollars of net income which the Treasury has realized for the years 1938-1957 from the combined O&C and CBWR lands.

The O&C Revested Lands Admin-

Years Later

A cruising party stops for lunch. Man at left is BLM management trainee getting on-the-job forestry experience

istration was organized in 1938 as a division of the General Land Office in the Department of the Interior. A headquarters office was established in Portland and district offices were established in Salem, Eugene, Roseburg, Coos Bay and Medford. Staffs were small in the beginning because income was low and costs of administration and protection were limited to 25 per cent of the receipts. As income from timber sales grew, the management organization was expanded. Each of the five district offices now has a staff of 40 professional foresters, plus necessary engineering and clerical personnel. Fire protection is provided by contracts with the fire control organizations of the Forest Service and the state of Oregon.

When the General Land Office was reorganized in 1946 and combined with the Grazing Service to form the Bureau of Land Management, its forestry functions, including the administration of the O&C lands, were transferred to the new bureau.

Roads on the O & C lands also provide access for hunters, fishermen, campers

Congress recognized that the land classification plan required by the 1916 Act, which returned these lands to federal ownership, was not suited to the needs of a permanent forest management program. Accordingly it provided in the Sustained Yield Act of 1937 for a general reclassification. Under this authority all of the lands formerly classified as agricultural were examined and reclassified for their highest use which, almost without exception, was found to be timber-growing. Much of the area so reclassified had been in the agricultural classification because the timber growing on it was young and too small in 1916 to be considered merchantable.

In 1946 and 1947, following a period of testing during the war years, the O&C lands were subdivided into 12 sustained yield units, each of which had an accompanying marketing area. These were for the purpose of applying sustained yield management locality by locality and contributing effectively to the economic stability of dependent communities. Purchasers of timber were required to have it manufactured through the rough lumber stage, or corresponding stages for other products, in the marketing area designated for the management unit in which the timber grew.

The marketing area feature of management was continued for ten years. During that period widely diversified manufacturing plants capable of making full use of both high and low grade timber were built in all of the 12 marketing areas. These developments in manufacturing, combined with equally important developments in logging, produced economic changes which made it unnecessary to continue the use of local marketing restrictions. Accordingly the marketing areas were abolished in the spring of 1957. The local sustained yield units now operate without any restrictions on the place where timber is manufactured.

The 1937 act gave discretionary authority to establish local forest units combining the O&C lands of private owners for cooperative sustained-yield forest management. None of these cooperative units have been established. Economic changes in the forest industries and other factors, accompanied by the spread of tree farming on private forest lands, have reduced the demand for cooperative sustained yield management to the vanishing point.

The timber on the portion of the O&C lands administered by the Bureau of Land Management as reported by the nation-wide *Timber Resource Survey* in the early 1930's had a merchantable volume of 45 billion board feet. The Bureau of Land Management's intensive inventory survey, now well advanced, indicates that the volume of timber today is substantially greater than in 1937. The increase has occurred despite the cutting of more than 9 billion board feet during the 20 years that have elapsed since the beginning of management. Growth which added much volume in the younger age classes, and improved utilization standards which increased the useable volume especially in the mature timber combined with a more accurate inventory of the timber in all age classes to more than compensate for the large volume removed by cutting. The total allowable annual timber cut has risen gradually and now stands at 692 million board feet as compared with 500 million board feet per year which was specified in the act of 1937. It can be expected to go still higher in the future. In several recent years the full amount of the annual timber cut currently allowable in those years has been sold.

Western Oregon no longer can afford the luxury of idle or partly idle forest land. The quantity of federal timber that can be made available continuously is the very life blood of dependent communities. All practical measures, therefore, are being taken to restock every acre of land with rapid growing young timber as soon as possible after logging. Nature, unaided, will reforest most areas if given time enough but waiting is too costly. Waiting would involve sacrificing not only 10 to 20 per cent of the potential timber yield of the two million acres but 10 to 20 per cent of the 10 thousand man-years of employment which the O&C lands are capable of providing each year.

In order to avoid such losses, an active reforestation program was started a number of years ago. Two lines of attack have been followed. One consists of preventive measures to reduce the delay in natural restocking of cutover lands where conditions indicate that delay is probable. The other consists of measures to reforest the accumulated acreage of land on which natural reforestation has failed to occur.

Various forms of preventive measures have been tried. The most effective one is a requirement that timber

purchasers have the cutover land planted immediately after logging, either with rodent-repellent treated seed or with nursery-grown seedlings, both of which are supplied by the bureau.

The rehabilitation phase of the program involves the necessity of obtaining substantial appropriations. Consequently only a small part of the 170,000 acres requiring such treatment has been rehabilitated. The total cost of getting these idle lands back into production may exceed five million dollars but this appears to be a good investment. Another ten to twenty years of idleness would mean the loss of twenty to forty million dollars worth of future timber.

The O&C counties recognized the importance of restoring the productivity of these idle lands and volunteered to share their O&C income on condition that it be used for reforestation. This led to the appropriation for the fiscal year ending June 30, 1958, of $1,000,000 for this purpose of which $900,000 will be reimbursed at the expense of the counties. It is expected that this appropriation will finance the reforestation of 30,000 acres. The area of previous plantations totals 33,000 acres.

A network of access roads is a prime necessity if the potential timber yield of an area as extensive as the O&C lands is to be realized. Much of the required road system already has been constructed and rapidly is being extended.

Several thousand miles of road have been built by private initiative under the terms of reciprocal road-use agreements. These agreements provide that the O&C timber shall bear a proportionate share of the cost of building the private roads which serve it. Purchasers of timber which must be hauled over private roads reimburse the capital investment of the road owner in proportion to the amount of timber hauled over the road and in addition pay a proportionate share of the cost of maintaining the roads. Reasonable allowances for such costs are made when the timber is appraised for sale. Persons who bid for the purchase of O&C timber do so with advance knowledge that they will be required to make these road-use payments.

When the government's proportionate share of the capital cost of a road has been reimbursed, no further payments for that purpose are made. In many instances, however, it will be necessary for the government to purchase the private owner's remaining interest in these roads in order to have access for future cycles of timber management. Appropriated funds are being used for such purchases.

Roads owned by the government provide access to private timber as well as government timber and enhance its market value. Persons who haul private timber over government roads are required to pay a capital reimbursement fee to the government until the proportionate share of construction cost chargeable to the private timber along the road has been fully reimbursed. Thereafter private timber hauled over any such road is re-

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Attractive streams for fishing, picnicking, and camping abound on O & C lands. Management plans protect recreational values

HORSEBACK HOLIDAY

By KATE SWIFT

A Trail Riders' saddle trip in the Great Smokies is an ideal vacation according to the author who enthusiastically recounts her experiences

Trail Rider Swift and her traveling companion, a beautiful mount named Two Bits

Jim Hubbard (left) shows trail riders a record-sized tuliptree — 22′ in circumference

Riders' backgrounds varied, but all shared common interests in woods, camping, etc.

"LUMBERMEN worked this forest up until about thirty years ago," Jim Hubbard said, swinging around in his saddle to face those of us who were bringing up the rear. "They were part of its history, and I'm glad their record remains in a few places like this."

The trail on which we were riding was the bed of an old logging railroad. Great moss-covered stumps among the younger trees on either side, an occasional rusted oil drum, and a pile of rotted timbers marking the site of an old logging deck—these were all that remained of the days when the slopes of the Great Smokies teemed with lumbering operations.

We were in the Great Smoky Mountains National Park, at one of the last places to be lumbered before the present park boundaries were established. It was an interesting contrast to other areas through which we had been riding—places where towering hemlocks, beeches, buckeyes, and tuliptrees still preserve the majesty of the primeval forest. I appreciated the opportunity to see this contrast. Like Jim, I am glad there are vestiges of the human economic activities that once penetrated this natural grandeur. They are part of its history, reflecting man's growing understanding of the forest and its uses.

It was partly to enhance our own understanding, and partly to have fun, that we—twenty-two members of The American Forestry Association—had gathered a few days before at the Cataloochee Ranch near Waynesville, North Carolina, for the AFA's 1957 saddle trip in the Great Smokies.

As a group we were probably typical of the hundreds of members who have taken advantage of the association's trail rider trips in different parts of the country. We had a manufacturer from Florida, a construction engineer from Maryland, a professor from the University of North Carolina, a newspaper woman from Boston, a pharmacist, a music teacher, a nurse, a banker, a housewife—to recall just a few.

Although most of us were but average riders and amateur naturalists, we all shared a love of the trail, of woodlands and mountains, and of camping. Our only professional in forest lore was Jim Hubbard, Administrative Forester of the North Carolina Department of Conservation and Development, who represented The American Forestry Association on the trip. My own enthusiasm for the venture had been heightened by my work at the American Museum of Natural History in New York where I had been watching the building of the new Hall of North American Forests.

A few days before I left for North Carolina, I looked at the forest hall's life-sized, three-dimensional exhibit representing a scene in the Great Smokies. The trees looked fantastically big and I was skeptical when Dr. Jack McCormick, staff ecologist in charge of the hall, told me, "These are average-sized trees down there."

It was a lovely morning late in May when our group arrived at the

Horses were essential to pioneer life in the Smokies. Today they help visitors to fully enjoy the wonders of the national park

Cataloochee Ranch. The gracious, informal atmosphere reflected the warm hospitality of our hosts, Tom and Judy Alexander. Their 1,500-acre tract, a working cattle ranch, borders the national park, and for over twenty years Tom has been leading groups of trail riders through the mountains. I found out that first day that his admonition to greenhorns applied particularly well to me. "We'll test out riders with horses this afternoon," he told us at lunch. "If you feel comfortable with your horse, fine. But if you don't—say so now. Once we're out on the trail we can't have riders switching horses at the drop of a hat."

An hour later we were off across the ranch fields, bobbing along exuberantly in single file behind our chief wrangler, Todd Henry. "Don't ride too close to the horse ahead," Todd called back. I had chosen a spirited little mare who, apparently recognizing limited experience in the saddle, was prancing from side to side in an effort to pass the horse ahead. Determined to appear competent, I tried to pretend that I was in full command of this performance. But the pretence shortly came to an abrupt end as we were ascending a steep treeless slope on a narrow switchback path. At one of the hairpin turns my little mare made a prancing step and I yanked on the reins. At the same moment my saddle slipped and I lurched to one side, my foot dangling over the decline which—as I saw it then—seemed to drop some three hundred feet at a forty-five degree angle (both distance and grade being somewhat exaggerated, I'm sure, by my uncomfortable position). I was still lodged lopsidedly on the saddle when Todd came clambering down the embankment on foot to help me dismount. "Good horse," he said as he tightened the girth. "She would not have fallen, but you might have. Better try a quieter one."

Back at the ranch Todd picked me out a beautiful horse named Two Bits. All the horses in Tom Alexander's stable were healthy, well-broken mounts, sure-footed on the steep and occasionally precarious mountain trails. The ten-day saddle trip might require a little more exertion from the riders than most of us were used to, Tom pointed out; but the horses would be doing the real work. Each of them would lose from fifteen to twenty pounds before the trip was over.

Our sojourn in the Great Smokies was to include a four-day primitive encampment deep in the wilderness section of the park. But for the first few days we lived at the ranch, riding out each morning after breakfast and returning late in the afternoon. I was glad that my first introduction to these mountains was in the spring when one can watch, through a day's ride, the progress of the season as it climbs the slopes. Flame azalea and mountain laurel, in lavish bloom in the valleys, still held their buds tightly closed at higher elevations. From our base at the ranch, over a mile above sea level, trails took us downward to meet oncoming summer and upward to peaks where winter seemed scarcely to have passed.

Although the great wealth and diversity of the park's native flora has been extolled by many writers, I was not prepared for the staggering va-

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Tom Alexander (center) and Jim Hubbard (right) prepare dinner. Hubbard, Administrative Forester, N. C. Dept. of Conservation, was AFA representative

YANKEE FORESTER

By CREIGHTON PEET

Forestry has been a lifelong job for Vermont State Forester Perry Merrill

AS he drives his yearly average of 30,000 miles through the leafy tunnels and past the magnificent views of the state he watches over, Vermont's State Forester Perry Merrill keeps reading to himself, "Pennsylvania . . . Oklahoma . . . Virginia . . . New York . . . California . . . Florida . . . Ohio . . . Michigan . . ."

It's a recital he can continue as long as he's behind the wheel, for these names are from the out-of-state license plates he spots on the road, and every one of them is a source of solid satisfaction. They are evidence that his thirty-eight years of devotion to Vermont's forests and parks, often for twelve hours a day and six days a week, have contributed substantially to bringing prosperity to the state's timbermen, and health and enjoyment to its constantly increasing stream of winter skiers and summer campers.

Tall, slender, and wearing a small, neat moustache, Perry Henry Merrill at sixty-three looks more like a college professor on a holiday than you might expect a man who has spent all his life in the open, to look. And forestry has been his lifelong job, for he first went to work for the Vermont Department of Forests and Parks in 1919 when, he recalls, the state had but four miles of paved roads, no real accommodations for campers at all, and the crop harvesting of trees was unknown. Following the accepted practice of the period in the U. S., whole sections of the state had been stripped bare, so that the greatest production of lumber in Vermont was between 1880 and 1910, and only in the past decades has careful, scientific management again resulted in similar annual yields. In 1955, Vermont produced 339,560 MBF of lumber. The difference today is that such yields are not the result of damaging, indiscriminate cutting but can be repeated year after year, indefinitely.

From the point of view of a forester, the project which has given Merrill the greatest satisfaction in recent years is the operation of the Mt. Mansfield State Forest. The first section of this 22,000-acre tract, now used extensively by skiers in winter and campers in summer, was purchased in 1914. But some 10,000 acres purchased in 1933 for $40,000 have been set aside as a demonstration of crop forestry, and the timber from it is now being sold to commercial operators licensed by the Vermont Department of Forests and Parks, in accordance with a twenty year cutting plan.

Throughout this tract, the department has built a system of good permanent roads (closed to the public), a convenience which adds from $4 to $10 a thousand to the value of the timber from this forest. Under recent sales contracts the revenue to the state will average about $25,000 a year. Since the trees which may be cut are marked by the department in accordance with the twenty-year rotation plan, such operations should continue indefinitely. It is estimated that at the end of the first planned twenty years, cutting can be resumed in the section cut the first year.

Perry Merrill's devotion to forestry has been lifelong. Born in Westport, N. Y., he graduated in forestry from the University of Syracuse in 1917, and after seeing service in France in World War I, joined the Vermont Department of Forests and Parks, taking time out in 1920 to spend a year studying forestry in Sweden, on a grant from the American Scandinavian Foundation. Then in 1924 he got his masters' degree at Yale. Since then he has been working in the service of Vermont in one capacity or another, despite the fact that the state's legislators, who are just a little techy about "outsiders" (such as "foreigners" born across the line in New York State), getting Vermont state jobs, examined him closely. However, there was never any question about his being qualified. In 1954 he received an honorary D.S. from Middlebury College.

In 1929 Merrill was made state forester, and shortly after he also served as alderman in the capital city of Montpelier, and then as mayor in 1934-35 — in addition to

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This abandoned South Dakota farm, filled with drifted soil, was typical of conditions that prevailed throughout the Great Plains in the disastrous Dust Bowl era in '30s

By ELMER W. SHAW

Editor, Rocky Mountain Forest and Range Experiment Station
Forest Service
U. S. Department of Agriculture

A NEW

IN the dry summer of 1933, a hot wind roared out of the West and made history. It kicked up one of the most frightening dust storms we had ever experienced. Farmers on the Great Plains thought it was the day of doom. Even cities on the East Coast felt the fury of the storm. For days, the sun over New York was dimmed by the billowing clouds of dust. And far out at sea, ships in the Atlantic got a taste of Kansas topsoil.

This dust-bowl disaster immediately aroused the American people. "Something must be done!" they clamored.

Among the proposals offered was the idea of planting trees in a wide belt across the drought-stricken prairies of the Great Plains. The plan was received with enthusiasm by some; others opposed it vigorously. The debate that followed involved scientists, meteorologists, foresters, nurserymen, farmers, politicians, statesmen, economists, writers, and laymen.

The tree-planting problem was further complicated by the financial depression of the early thirties. Unemployment, relief programs, and national distress in general had to be considered along with complex questions of soil conservation and tree ecology.

Out of the discussion and high-level planning evolved the Great Plains Shelterbelt Project. By 1935 the project was organized, and by 1937 the program began to roll. Landowners agreed to furnish the growing space, care for the trees, and protect the young windbreak, if the government would supply the seedlings and help plant them.

During the 8 years that the project was active, more than 200 million trees and shrubs of 40 different species were planted. The windbreaks in their scattered pattern extended from the Canadian border southward through eastern North Dakota,

LOOK AT SHELTERBELTS

South Dakota, Nebraska, central Kansas, western Oklahoma, and into the Texas Panhandle. In 1942 when the project ended, 18,600 miles of field windbreaks had been launched on 30,000 different farms.

In 1944, the U. S. Forest Service made a preliminary checkup on the shelterbelt plantings. It was still too early to make long-range predictions, but the plantings showed promise and results were encouraging.

Again in 1954, the Forest Service with the help of other agencies, made another survey of the same sample windbreaks. This time, findings were more clearcut, for now many of the plantings had been under trial for almost 20 years.

This resurvey was designed to gather detailed information on each species — data on survival, total height, diameter, crown spread, and vigor—as well as information on the overall effectiveness of each windbreak as a unit. Because the survey was limited in scope, it was unable to measure directly the effect of windbreaks on crops and livestock, wind erosion, esthetic values, and human satisfaction.

The man assigned to spearhead the 1954 resurvey was Ralph A. Read. Ralph is research center leader at Lincoln, Nebraska, for the Rocky Mountain Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture.

When I learned that Ralph had been given the opportunity to get a new look at the Great Plains shelterbelt, like hundreds of other foresters, I was eager to find out what he had learned. So the next time I was in his office at Lincoln, we had a pow-wow on the subject. Our discussion went something like this:

"First of all, Ralph, how are the windbreaks holding up?"

"Just a minute, Elmer," he said, turning to the file cabinet to draw out a 190-page typewritten manuscript. "Here are the results of our recent survey—the facts in an *oversized* nutshell. Now to answer your question—of the 938 windbreaks sampled, 48 percent rated excellent or good; 29 percent, fair; 18 percent, poor; and 5 percent, destroyed."

"What about height?"

Turning quickly to one of the graphs, he read off the figures: "Sixteen percent of the plantings were at least 50 feet tall; 38 percent were between 35 and 50 feet; and evergreens averaged 10 feet.

Eyeing the impressive manuscript on Ralph's desk, I asked jokingly, "What's to become of the big opus?"

"Opus is right," he beamed with

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Eastern red cedar on outside rows of Kansas windbreak makes excellent barrier. Age, 14 yrs.; survival 90% ; average height 15′

A BUSHEL

Drawing by wildlife artist Bob Hines

A whitetail deer is a lovely creature. But when they become too numerous, as in Michigan, they starve themselves, destroy aspen forests, and work a hardship on industry

A BUCK

By WILL BARKER

ALL summer long a Michigan whitetail requires nearly 5 lbs. of green leaves and twigs each and every day to stay healthy. Another 5 pounds, almost a bushel of assorted twigs and buds, is needed each and every day all winter long if the same animal is to come through this season in good condition.

Today, with the herd ten times the size it was 100 years ago, the whitetails in Michigan's woods are eating themselves to death. At the same time they are destroying the stands of aspens—trees that since 1949 have become a valuable forest resource. For in that year the American Box Board Company of Filer City adopted a special process to convert aspen pulp into strong corrugated paperboard for shipping containers. This created an entirely new industry for lower Michigan. It made use of trees that were formerly considered "weed" trees, but ones that were a great source of food for deer.

The available browse in most areas of Michigan is insufficient to meet the food requirements of the state's more than 70,000 whitetails—the most recent estimate of the U. S. Fish and Wildlife Service.

This lack of browse means that Michigan's whitetails are underweight by 50 to 70 pounds; that the fawn crops are not so large or so healthy as they should be; and that the winter die-off is often tremendous. During the winter and spring of 1951, deaths from malnutrition and exposure on the Lower Peninsula alone were estimated at 50,000.

The current overabundance of whitetails in Michigan, and in other states, is due to the fact that this deer has the ability to adapt to the fringes of civilization. The animal has adapted so well that there are some 4,700,000 whitetails in 43 of the 48 states. And practically everywhere these deer compete with one another, and other wild and domesticated animals, for browse and the other requisites they need in order to live.

The reasons for the enormous increase in whitetails are: 1) The many tracts of cutover timberland in brush and sprout-growth stage. This provides the type of habitat that the whitetail likes. 2) The few natural controls such as coyotes, mountain lions, and wolves. The reduction in the numbers of deer predators is due to the various control campaigns. 3) The rapidity with which the whitetail multiplies. The male is polygamous and the female is fecund. After the first year in which only a single fawn is dropped, the doe usually bears two fawns, though there are sometimes three, and occasionally four.

As cause comes before effect, let's see how the large whitetail population came into being in Michigan.

Once the state had great stands of pines and tall, full-grown timber of virgin quality. Such forests do not provide sufficient undergrowth to feed great numbers of deer. And without plenty of food the animals do not multiply by leaps and bounds. But the day of the deer was coming.

By 1850 the ring of the loggers' axes could be heard in the pineries of Lower Michigan. By 1900 most of the red and white pine had been cut. And, after the timber was out, fires were deliberately set to get rid of the slash.

These fires and others that were to follow killed the young conifers. This left the land in condition to encourage the establishment of the hardwoods and their subsequent growth. Thus, the pineries of lower Michigan were transformed into almost ideal habitat for whitetails. For these cutover areas were interspersed with grassy openings and swampy thickets in which the conifers had not been burned.

By 1870 the whitetails in Michigan's woods had benefited so much by the new man-made environment that market hunters had a heyday. In 1880 shipping records show that more than 100,000 deer carcasses were sent to markets from express railway stations on the Lower Peninsula.

For the next 20 years market hunters killed without restriction, so that by 1900 whitetails were actually scarce. Then a new cycle began: fire control was initiated in 1910, with results of this control becoming evident between 1915 and 1920. During this period the "brush" fields continued to maintain themselves by sprouting. And in 1921 the "buck law" was adopted, and game laws in general from then on were more strictly enforced.

Ten years later (1931), there were too many deer in many areas of the Lower Peninsula. The animals were rapidly destroying their winter food—a buck was hard put to get the bushel of twigs and buds it needed to fulfill dietary requirements—and winter starvation was common.

Today, the situation is equally bad. It affects not only the well-being of the whitetails, but also the forests in which the deer herds are extra-large, but in which the animals, themselves, are extra-small. A buck that should weigh 175 pounds, weighs only 100 or 110 pounds.

The staff of life for the whitetail is a combination of the leaves and small branches of the aspen, the "popple." Michigan's cutover areas and the sandy soils of the Lower Peninsula are ideal for aspen growth. Of the two aspens in the state, the bigtooth and the trembling, the bigtooth is the most numerous on the Lower Peninsula.

A peculiarity of the aspen is responsible for its continued thriving. This is a tree that reproduces from root suckers. And the root system extends outward as much as 60 feet from the base. Thus, when an aspen is cut, the roots surrounding the stump send up shoots. And these shoots develop into trees!

It is not uncommon for 100 new trees to start from the roots of a mature aspen after it is harvested!

In aspen forests, there are usually some maples, birches, and cherries. When cut along with aspen for pulpwood, the sprouts developing from the cherry, maple, and birch trees are well-liked by whitetails. A typi-

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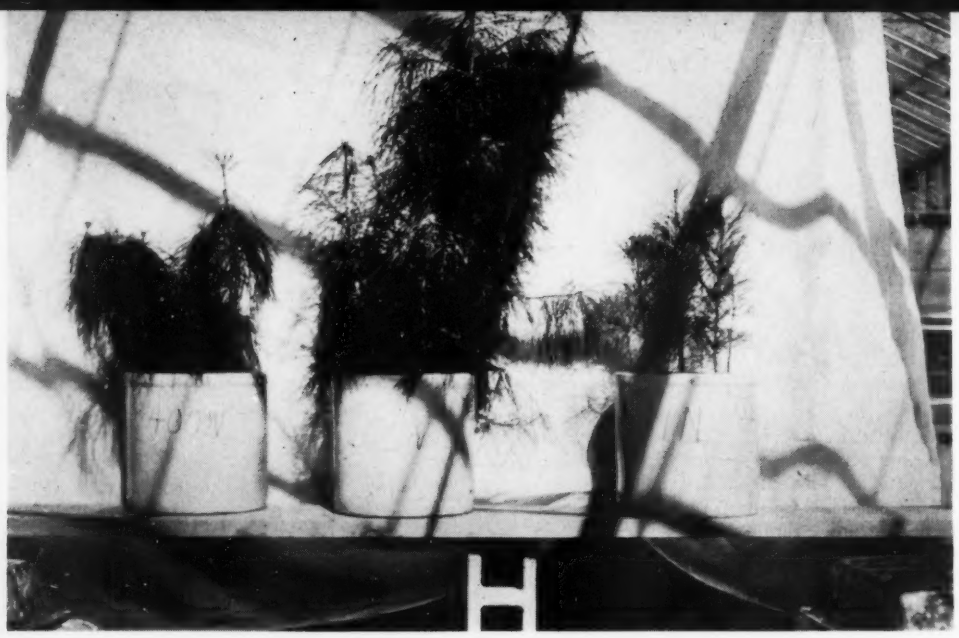

Loblolly growth inhibited by too much nitrogen (left), too little (right)

What About FERTILIZING FORESTS?

By H. A. FOWELLS

Staff Specialist, Division of Forest Management Research, Forest Service

THIS question has been asked many times in the past year—by foresters, by representatives of chemical and fertilizer companies, and by an interested public.

Growth of forests undoubtedly can be increased by the application of fertilizers—under certain conditions. Tests from many parts of the world show this to be true. And it really isn't very surprising. Trees, like all plants, require certain elements for their growth and development. For many plants those needed in relatively large amounts, in addition to carbon, oxygen and hydrogen, are nitrogen, phosphorus, potassium, calcium, magnesium, and sulphur. Others vital to the growth and development of the plant but necessary in much smaller quantities are iron, copper, zinc, manganese, molybdenum, and boron. There is evidence that chlorine is required by some plants and many more elements are found in plant tissue. Obviously the plant will respond to the addition of one of the required elements which is present in too low supply, provided some other factor does not become limiting.

That trees in some areas have needed some, or more, of these elements is shown by a number of trials. For example, in New York State, red pine on potassium deficient soils about doubled its height growth after being treated with potassium fertilizer. In the state of Washington Douglasfir saplings on a poor site grew markedly more in height after receiving a treatment of nitrogen fertilizer. Pole stands also on poor sites responded to applications of fertilizer by an estimated increase in volume of 65 percent over an unfertilized stand during a five-year period. In California, heavier seed crops were borne on sugar pine trees fertilized with ammonium phosphate than on unfertilized trees, and seed crops of young loblolly pines in North Carolina were increased after the trees were treated with a complete fertilizer.

In other parts of the world the need for fertilizing under certain conditions has been recognized for many years. In northern Europe the use of calcium, of potassium, of ni-

trogen, or of phosphate is recommended on certain soils. Successful afforestation of heaths in Britain seems to be possible only with fertilization. In Australia the application of phosphate to some soils has been shown to more than pay its way through increased yields of timber. And on other soils in Australia pines now grow poorly unless they are supplied with a very small amount of zinc. A single treatment with this minor element is apparently enough.

But before fertilizing forest trees can become a common practice in this country, we need information concerning requirements of various species for the nutrients and the response of the species to fertilizers on a multitude of forest soils. Without this information there could be many hit or miss attempts to improve tree growth by adding fertilizers. For example, in the red pine study in New York, only fertilizers containing potassium were effective in overcoming stagnation of the trees. Of course, complete fertilizers contain potassium but there would have been no point in adding the other components just to get the potassium. Although it is unlikely that forest owners would apply so much common fertilizers as to cause damage, this is possible with some minor elements. For a few of these there exists for many plants a rather narrow range between the requirement level and the toxicity level. Obviously forest owners should apply only the nutrients needed, and in the amounts needed, by the trees.

Where can such information be found? Unfortunately, there has been too little research to date to provide answers for most of the important forest tree species. Some answers have been provided by graduate students and professors at several universities and by research foresters in the Forest Service. A recent publication, "Forest Fertilization," from the New York State College of Forestry, brings together the information on this subject. But there remains a big job for research before guidelines can be established for the forest owner.

Foresters, forest soil experts, and plant physiologists are starting more and more studies in this field. And they are being aided in some instances by interested chemical and fertilizer companies. Two general kinds of studies are under way. One is the field trial where definite amounts of fertilizer are added to a known area of forest and the response of the tree in growth or development is measured. Frequently the soil is analyzed to find out how much of a given nutrient is available. But in the soil the amount of some nutrients often varies seasonally and the availability of others to plants is measured with uncertainty. However, the amount of nutrient contained in the leaves of plants is often indicative of the fertility of the soil, so foliar analysis can be used to assay the availability of nutrients to trees, or the need of the tree for more nutrient. Another kind is the greenhouse study with the trees grown in sand or nutrient culture and supplied with definite amounts of nutrients and grown under controlled conditions. Here the relation between growth and nutrient supply can be established quite definitely. Tests of both kinds are in progress in the Branch of Research of the Forest Service.

Field tests under way are scattered throughout the forest regions of the country. At the Lake City, Florida, center of the Southeastern Forest

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Greenhouse study of nitrogen and phosphorus requirements of Virginia and loblolly pine at the University of Maryland

Pinchot Medal Awarded to Clepper; Lutz, Larsen Honored for Research

Henry Clepper, who completed 20 years of service as secretary of the Society of American Foresters on November 13, has been awarded the society's Gifford Pinchot Medal. Regarded as one of forestry's highest awards, the Pinchot Medal commemorates the first Chief Forester and founder of the professional society. The medal was presented *in absentia* at Syracuse to E. L. Demmon, past president, for transmittal to Mr. Clepper who is attending the meeting of the Food and Agriculture Organization of the United Nations in Rome. With him are *R. E. McArdle*, Forest Service Chief, and *Dr. Verne Harper*, also of the service. Earlier recipients of the Pinchot Award have been *Henry S. Graves, Raphael Zon, William L. Hall* and *Inman F. Eldredge*. Mr. Clepper was elected a Fellow of the society in 1949.

Two awards for outstanding achievement in biological research were also announced by President *DeWitt Nelson*. They were conferred on *Dr. Harold J. Lutz*, of the Yale School of Forestry, for his studies on the ecological effects of forest fire in the interior of Alaska; and *Dr. C. Syrach Larsen*, of Denmark, for his studies on forest tree improvement through genetics.

Left, Henry Clepper, secretary, Society of American Foresters

FORESTRY RECEIVES $40,000 GRANT

A $40,000 study to bolster the status of forestry and the training of foresters that will accent "quality not quantity" was one answer of the profession to Sputnik and the Space Age at the annual meeting of the Society of American Foresters at Syracuse, New York.

With foresters in a thoughtful mood, some 70 scientific and technical papers stressed: 1) that foresters must critically examine their own work and all plans for the future in the light of foreign research advances; and 2) foresters must give more and more attention to people and their relationship to resources including such allied fields as recreation and water and wildlife management.

President Nelson announced that the Old Dominion Foundation has provided the grant which will enable the society to examine the profession's needs for the next quarter of a century. As spelled out by Prof. T. D. Stevens, of Michigan State University, the study proposes: 1) to strengthen accreditation in forestry schools; 2) to provide registration of foresters as has already been done in two states; 3) to further emphasize the humanities and how they affect forestry; 4) provide greater cooperation on the part of industry in establishing scholarships; and 5) to publicize forestry career opportunities.

In an address on the public relations approach to recruiting forestry students, Prof. Floyd E. Carlson, of Syracuse University, urged that an approach be made to the Advertising Council to conduct a nationwide campaign aimed to interest youth in forestry and that foresters join with the engineers, the Atomic Energy Commission and the National Science Foundation to acquaint youth regarding professional opportunities now open or opening in scientific fields.

In general, foresters at Syracuse from President DeWitt Nelson on down the line were less concerned as to whether their various programs are "good" and more concerned with whether they are "good enough." Like numerous other professions in recent months, the foresters were inclined to place a big question mark before results of all their programs ranging from the recruitment of high school students to research and forest management.

This inquiring attitude was punctuated by the address of Dr. Fairfield Osborn, president of the Conservation Foundation, who quoted Voltaire's definition of an optimist to the professionals. "Optimism," Voltaire said, "is the madness of maintaining that everything is right when it is wrong."

After praising foresters for progress that proved some of his own earlier predictions regarding forestry to have been in error, Dr. Osborn said that nevertheless, "I, for one, would be far more optimistic as to the future of the natural resource position of our country were it not for the extraordinary increase of our population with the prospect of 70 to 80 million more Americans in the next 25 years or so. Certainly the forestry industry will be hard-pressed to cope with the increased demands that will be placed upon it."

Two concerns of Dr. Osborn at Syracuse were the growing use of pesticides by forestry and agriculture and the world's growing population. On pesticides, the conservationist urged that the foresters leave no stone unturned in determining, by thorough research, whether the use of poisons for curbing tree diseases and insect ravages are fully justified.

"We, together with everybody else, have to admit . . . that not enough is yet known concerning the long-term effects of widespread pesticide controls," Dr. Osborn said. "There are those who doubt that even from the

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SENTIMENT GROWS FOR REPEAL OF P.L. 587

REPEAL of P.L. 587 (the Klamath Indian termination act which permits quick liquidation of the Indian timber) was cited last month as one solution to the perplexing Indian problem. The proposal was put forward by AFA Chief Forester Kenneth B. Pomeroy at the annual meeting of the Society of American Foresters at Syracuse. In this event the Indian Service would continue to manage the forest under the present arrangement whereby the Klamath Indians pay for actual costs of administration.

Sentiment in favor of the repeal of the obnoxious law continued to grow last month as arguments continue to be found against every proposal put forward by interested groups. One of the latest was that of the Weyerhaeuser Timber Company which cites that the government is playing two roles in the Indian matter, that of "guardian" of the Indians and therefore duty bound to obtain the best possible price for the timber and that of "sovereign," which means the government is also responsible for the economy of Oregon.

The proposal suggested by George Weyerhaeuser at hearings held by Senator Neuberger in Oregon would permit industry to purchase the Indian timber at a price which would include the sustained yield and other carrying costs. The government, as the "guardian" would then pay the Indians what amounts to a subsidy to make up the difference between sustained yield and liquidation purchase prices. Actually, the two costs may not be too divergent, Weyerhaeuser said.

In return, the industry purchasing the timber would agree to abide by the terms of a long-term covenant which Weyerhaeuser said represents the "lesser of two evils" as between this form of federal regulation and government purchase of the timber. Some government spokesmen called the Weyerhaeuser proposal "statesmanlike" but events are showing that it exerts little appeal to "little people" who dislike the subsidy aspect of the proposition and who would be unable to enter into and carry out what would obviously be rigid covenant agreements that would undergo periodic government inspection. The plan, in short, would seem to make a virtue of bigness.

Examination of the transcript of the Neuberger hearings in Oregon also revealed another development that may make outright repeal of the law more attractive to the public. In reply to questioning by committee counsel Robert Wolf, one witness admitted that he had heard of the existence of a power of attorney agreement that promises "certain parties" some six percent of the profits from each parcel of Indian timber. Neither Wolf nor the witness elaborated on this statement which remains unchallenged up to this time.

Aside from the Indian matter, the proposal by Weyerhaeuser that industry should agree to some form of regulation in the event it obtains the timber was causing more discussion than any forestry topic in many a day. It would seem to indicate that the so-called antipathy of industry to a national timber referee of some type is not so grimly unyielding as many people have been led to believe. Meanwhile, at least one representative of the Forest Service at Syracuse said he personally disliked the Weyerhaeuser proposal "because it might cast the Forest Service in the role of a policeman."

"We don't want to be policemen," this representative said — which would seem to mark a departure from beliefs entertained by some representatives of the service a decade or more ago. In other words, if this topic is broached again when southern and western business really begins to hurt for wood, the regulation proposal will come from some other source than the Forest Service.

In another Klamath proposal, Leonard B. Netzorg, counsel for the Western Forest Industries Association, the government would be authorized to purchase, at the appraised retail value, enough of the timberlands to make the pro rata payments to Indians who withdraw from the tribe. The money would come from a fixed appropriation based on a percentage of total national forest receipts (now running in excess of 100 million dollars a year). Payments would be extended over a period of five or six years. The lands would assume the status of other national forest lands.

Those Indians who wished to retain tribal identity would, through whatever entity they establish, enter into a long-term contract with the Forest Service for management of the remaining lands. Mr. Netzorg pointed out that similar contracts exist in Oregon with two cities and one county. The tribe would pay the Forest Service for the actual cost of services rendered. Revenues from the forest, which would be managed as one unit, would be allocated between the Forest Service and the tribe on the basis of the value of the

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Society of American Foresters' President DeWitt Nelson (left) with Commissioner Sharon J. Mauhs of New York State Conservation Dept., and Dwight B. Demeritt

NLMA CHARTS NEW COURSE

A PROPOSAL to inaugurate a national wood merchandising program highlighted the 1957 annual meeting of the National Lumber Manufacturers Association in Washington, D. C. last month.

This program was introduced as a decisive plan of action to boost sagging lumber sales, regain markets lost to competitive materials, and to expand the lumber economy. In urging adoption of this promotional campaign, NLMA president Walter M. Leuthold said, "The primary objective of our national merchandising program would be to make the consumer decide on wood." He then alluded to the successful promotional campaigns for steel, aluminum and plastics, and declared that a national merchandising program can do the same for lumber and wood products. "One fact is clear," he added, "the industry that pinches on its advertising dollars is only shortchanging itself."

To lay the groundwork for such an extensive undertaking, NLMA's Board of Directors appropriated $25,000. The board voted to submit the merchandising program to an advertising agency to develop a full-scale, detailed plan of action, based on an annual expenditure of $1,250,000. The agency will prepare sample merchandising-advertising material and draw up a blueprint of how NLMA merchandising efforts could best be coordinated with but not duplicate regional activities. It is expected that the agency will report within 90 days so that the proposals may be presented to the membership as soon as possible.

While the meeting was primarily devoted to the future economic prospects of the lumber industry, members viewed with great concern the limited number of graduates being produced by forestry schools, and the scarcity of qualified young people entering the industry. To help improve this critical situation, NLMA directors authorized the association to hire an additional staff member to launch a special educational guidance program aimed at interesting young people in the forest industries. The program provides for the publication of booklets on career opportunities in the forest products industries and the field of wood technology.

These booklets are to be prepared in cooperation with the Forest Products Research Society of Madison, Wisconsin, and will be distributed to the students and educational guidance counselors of high schools and colleges throughout the country. A permanent NLMA Committee on Education will direct the over all program.

The directors also authorized NLMA to award four to six $500 scholarships in 1958 to outstanding forestry school students. These scholarships will include six weeks on-the-job training in wood products research at the laboratory of the Timber Engineering Company in Washington, D. C.

Another major action of the board was a resolution requesting the Forest Industries Council, a policy coordinating organization of the lumber, paper and pulpwood industries, to establish a National Forest Pest Action Committee. The purpose of this committee would be to advise public and private agencies on current forest insect and disease problems and help coordinate public-private programs in this field.

In other actions NLMA urged Congress to approve legislation providing for a study and realignment of the federal-state-private land ownership pattern. The association specifically endorsed the ownership study bill by Senator Long of Louisiana. The directors also endorsed the holding of a World Forestry Congress in the United States in 1960, but called for a ban on representatives from Russia and the other Communist countries.

A special feature of the NLMA meeting was the celebration of the silver anniversary of the Timber Engineering Company. Harry G. Uhl, retiring president of TECO, reported on the company's achievements in the fields of engineering, research, product development and wood promotion during the past 25 years. In looking to the future, Mortimer B. Doyle, executive vice president of NLMA and board chairman of TECO, predicted the association's research arm will attain even greater prominence and stature in the years ahead.

In recognition of Mr. Uhl's 37 years of service to the lumber and wood using industries, NLMA directors approved a resolution citing him for "unswerving devotion to the betterment of the lumber industry." The resolution stated: "None has given more devotedly of his time and effort and few can match his record of accomplishments."

Another highlight of the meeting was a panel discussion on the "Economic Outlook for 1958" by four of the nation's top economists. Ralph

HARRY G. UHL RETIRES

Harry G. Uhl, president, Timber Engineering Company, engineering and research affiliate of the National Lumber Manufacturers Association, retired November 12, 1957, after 37 years' service to the lumber and wood using industries. Mr. Uhl announced his retirement at the annual meetings of the Board of Directors of the National Lumber Manufacturers Association and Timber Engineering Company. The occasion was marked with a special tribute to him by leaders of the lumber manufacturing industry for his long record of service. The meetings also marked the 25th anniversary of TECO which Mr. Uhl helped establish.

Guest speaker, Assistant Secretary of Agriculture Ervin L. Peterson (center) being greeted by NLMA President Walter Leuthold (left) and Lawrence Kellogg, Chairman, Board of Directors (right)

Recently-appointed Exec. Vice President M. B. Doyle (right) discusses annual meeting program with L. D. Kellogg (left), and NLMA Secretary Henry Bahr

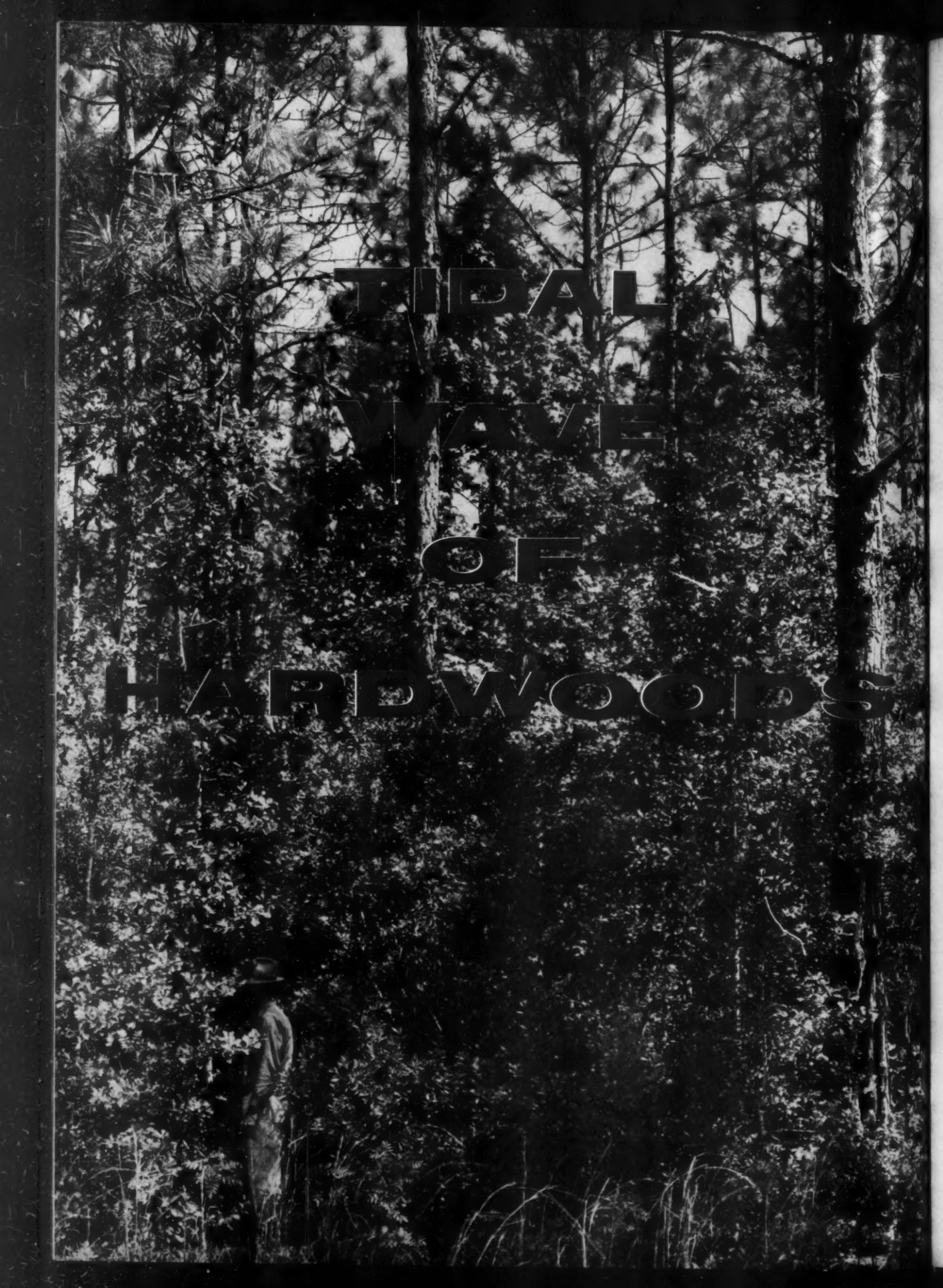
Robey, economic adviser of the National Association of Manufacturers, startled lumbermen with his forecast of a tax cut in 1958, which he predicted will cause an economic upturn. Herbert Stein, research director of the Committee for Economic Development, predicted the economy will continue at its present level for the next several months and probably through most of 1958.

Emerson P. Schmidt, economic research director of the U. S. Chamber of Commerce, told the group that he believed that 1958 will not be as good as 1957 although the long-range factors for expansion continue strong. Schmidt said that the economy is overdue for a downturn and that we are in for more than a rolling adjustment. He further predicted that 1958 will see a good deal of price cutting — both announced and unannounced.

Nathaniel Rogg, director of the Economics Department of the National Association of Home Builders, predicted little change in the volume of home building next year compared with 1957, and estimated housing starts in 1958 at close to the one million level. Dr. Rogg said he saw no change in new home prices during 1958, but an easing in the availability of mortgage funds later in the year.

The automobile industry has sold the consumer on buying more car than he needs, Dr. Rogg declared, and home builders must follow suit by getting away from the idea of building only the "minimum house." He asserted that the basic need for housing is 200,000 units a year above the present rate of home building; and that in order to meet the demands of an expanding and moving population, housing in the next ten years must total at least 12 million units — "and even then we'd just be standing still," he said.

Election of national officers climaxed the NLMA annual meeting. Mr. N. Floyd McGowin, president of the W. T. Smith Lumber Co., Chapman, Alabama, was elected NLMA president for 1958. McGowin succeeds Walter M. Leuthold, Deer Park, Washington, lumberman and board chairman of Kootenay Forest Products, Ltd., Nelson, British Columbia. Leuthold was elected NLMA board chairman succeeding Lawrence D. Kellogg, president of the L. D. Kellogg Lumber Company, Alexandria, Louisiana, who becomes NLMA's Policy Committee Chairman.


TIDAL
WAVE
OF
HARDWOODS

Intensive fire protection in the South has inadvertently caused the destruction of valuable pine forests. Without fires to burn off underbrush, low-quality hardwoods have invaded—deterring pine regeneration

By FRANK HEYWARD, JR.

WORTHLESS hardwoods, like a gigantic tidal wave, are inundating the South's forests, forcing out and replacing valuable pines on millions of acres. From Virginia to Texas the tenacity and aggressiveness of unwanted hardwoods are manifest in stands of wanted pine.

The widespread occurrence of the replacement of pine by hardwoods is clearly shown by numerous reports of the Forest Survey by the U. S. Forest Service. It will be recalled that two regional surveys were made, the first in the 1930's and the second in the 1950's.

A survey report for coastal North Carolina reveals that the pine forest type decreased from 76 to 64 percent between surveys while the hardwood type increased from 24 to 36 percent. A report for Georgia says, "On a large part of the pine and oak-pine type area, hardwoods are increasing so much faster than pine that they are rapidly filling in the remaining open gaps in the stands, leaving little or no opportunity for an increase in pine stocking. . . . Unless measures are taken to remove or destroy this undesirable material in the stands, further shifts from pine to hardwood types can be expected." In comparing statistics for the two surveys as they applied to South Carolina, Georgia, and Florida combined, the Forest Service showed that the pine type had decreased in area by 3.7 million acres, whereas the hardwood type had increased by 7.1 million acres. Survey reports for all other southern states show the same trend—the area of hardwood is increasing whereas the area of pines is decreasing. The statistics are impressive. They are also ominous.

During the period 1932 to 1952, hardwoods replaced pine as a forestry type on 13 million acres in the South—an average of 650,000 acres per year. This is an economic catastrophe of no small proportions because the hardwoods are of such species and quality that their utilization by industry is not in the foreseeable future. The mere presence of huge quantities of unusable trees would be bad enough, but when the unusable trees exclude valuable ones, even preventing their regeneration, the matter attains serious proportions.

For the past 25 years, the South has been so busy developing fire protection and planting pines that, in the main, it has overlooked a situation that can be overlooked no longer. Hardwoods are taking over.

To be sure the more progressive landowners have long recognized the designs of hardwoods, and many have undertaken well-planned and executed programs to resist the change from valuable pine to nonsalable hardwood. But as a region, the South still slumbers, and every night that it does, hardwoods gain dominance on 1781 acres of pine land.

No one questions the need for fire protection. It is the most fundamental of all forestry measures. But, as with many activities, it is characterized by some undesirable features as well as desirable ones. A comparable example is tilling the soil. Now tilling the soil is an absolute necessity in agriculture; nevertheless, it does encourage soil erosion. Just as soon as this fact was recognized, contour plowing was introduced, thereby permitting the continuance of cultivation and minimizing erosion. So it must be with fire protection. Its undesirable accompaniments, in this case encouragement of hardwoods, must be recognized and held in check by counter measures, because a forest can no more do without fire protection than a farm without cultivation.

What accounts for the aggressiveness of hardwoods? The problem may be considered in two unrelated but supplementary parts. The first has to do with hardwood invasion and the second with hardwoods as a residual on land after removal of the pine. Invasion is a relatively slow process involving a score of years or more, whereas a change of

Figure 2. Close-up view of the forest floor of area shown in Figure 1. At this point there were 1,100 water oaks per acre, larger than one inch in diameter. Dense growth of hardwoods such as shown here precludes the possibility of pine reseeding naturally

Figure 1 (left). Dense underbrush of hardwoods in pine forest. Exclusion of fires for 15 years permitted hardwoods to reseed. Most prevalent species are water and laurel oak, red gum, maple

Figure 3. An idea of future development of hardwoods after invading pine forest. In this stand, originally pure pine, the hardwoods now occupy as much space as pine

type from pine to hardwood as a result of the method of cutting requires only the time necessary for logging off the pine.

For many years botanists and some foresters have recognized that the climax forest in the South's pine lands is oak-hickory. This means that the forces of Nature favor forests in which oaks and hickories predominate, instead of pines, and, unless the natural forces are interrupted, oaks and hickories will ultimately prevail, with pines either subordinate or completely eliminated.

The botanical characteristics of pines, especially long-leaf and slash, are such that they cannot reproduce and succeed themselves in much of the South's forests without some assistance. In past years the assistance has been in the form of widespread fires, a condition pointed out time after time by Professor H. H. Chapman of Yale. The apparent anomaly of fires assisting the growth of pines is explained by the marked difference between the fire tolerance of pines and hardwoods. The thicker, looser bark of pines renders them far more resistant to fires that creep through the forest than the thin, tight bark of hardwoods. Of course severe fires wipe out all trees, regardless of kind.

Prior to the adoption of fire protection, the South's pinelands were burned over frequently. This is attested in many of the earliest historical records of the region. These wild fires no doubt caused considerable damage to the pines, killing, directly or indirectly by encouraging butt rot, a sufficient number to render the forests open grown and understocked. But the fires did prevent the inroads of hardwoods. Occurring at intervals of only a few years, the wild fires did not have a great accumulation of inflammable debris for fuel. For this reason they sometimes crept slowly through the forest causing only slight damage to pines as small as one to two inches in diameter but effectively killing most hardwoods of that size.

In 1888, Miss Ellen Long, a botanist, wrote, ". . . but for the continual firing that prevails so generally throughout the South, the Maritime Pine Belt would soon disappear and give place to a jungle of hardwood and deciduous trees." R. M. Harper supported this view and in 1911, stated, ". . . if fire were withheld too long, the oaks and other hardwoods which grow in the longleaf pine regions would take possession of the ground and crowd the pine out."

Although these observations apply particularly to longleaf and slash, the highly detrimental effect of hardwoods on the growth of loblolly and also shortleaf pines is evident on extensive areas.

In general, pine seedlings need lots of sunlight for best growth. They detest heavy shade. With most hardwoods, shade is no deterrent to their regeneration. Now the exclusion of fire is frequently attended by an accumulation of a blanket-like layer of leaves and pine straw on the soil surface. This is usually accompanied by development of a dense growth of hardwood underbrush. Whereas pines regenerate poorly, if at all, under such conditions, hardwoods readily can and do. It's that simple. When the pines are harvested, unless a sufficient source of seed is left, pine reproduction is inadequate. And on many occasions, even though a generous seed source is left, pine reproduction still fails to become established. Obtaining good pine reproduction is not always easy.

With the advent of fire protection, an invitation of welcome was extended the hardwoods. It was accepted with alacrity.

The next stage of hardwood development is shown by Figure 3. In this forest, fire protection has permitted invasion by hardwoods. This development has continued until the trees, underbrush no longer, have attained tree size.

The ultimate development of hardwoods is seen from Figure 4. On this area, an island off the Atlantic Coast, no fires had occurred during the life of the forest. This meant that the tendency of Nature to grow hardwoods had been unopposed. This resulted in laurel and water oaks as tall as the pines. Pine reproduction was practically nonexistent, whereas hardwood reproduction was profuse. Clearly removal of the present pines, either by old age or logging, would be the end of the pine component of the forest, and the invasion by hardwoods would become complete and irrevocable unless measures to control them were effected.

Since the Timber Resources Review published the fact that, for the year 1952, forest growth in the South exceeded the cut, there has been some tendency to assume that "we're over the hump" as far as growing an adequate quantity of pine is concerned. Forestry forces were proud to find that at long last they had succeeded in winning the fight to balance the pine cutting budget. And their pride was indeed justified, for the fight had been a long and grueling one.

But while they were making widespread efforts fighting forest fires and destructive cutting, and attempting to arouse an indifferent public to the advantages of Tree Farming, insidious forces favoring hardwoods over pine were equally widespread and effective.

The forests of southern pine, because of their very real assets, have been publicized to such an extent that foresters and industry in general have been reticent to give much attention to hardwoods. A capricious nature has now intervened. Make no mistake about it, hardwoods will receive attention in the future and plenty of it—or else!

The South's original forest was estimated to be comprised of 55 percent hardwoods to 45 percent pine.

Figure 4. Ultimate development of hardwoods which invaded a pine stand is shown here. Many trees, mostly laurel and water oaks, are as tall as the dominant pines. Each takes up several times as much growing space. Pine reproduction is almost completely absent while hardwood seedlings are abundant. Only artificial help can save pines

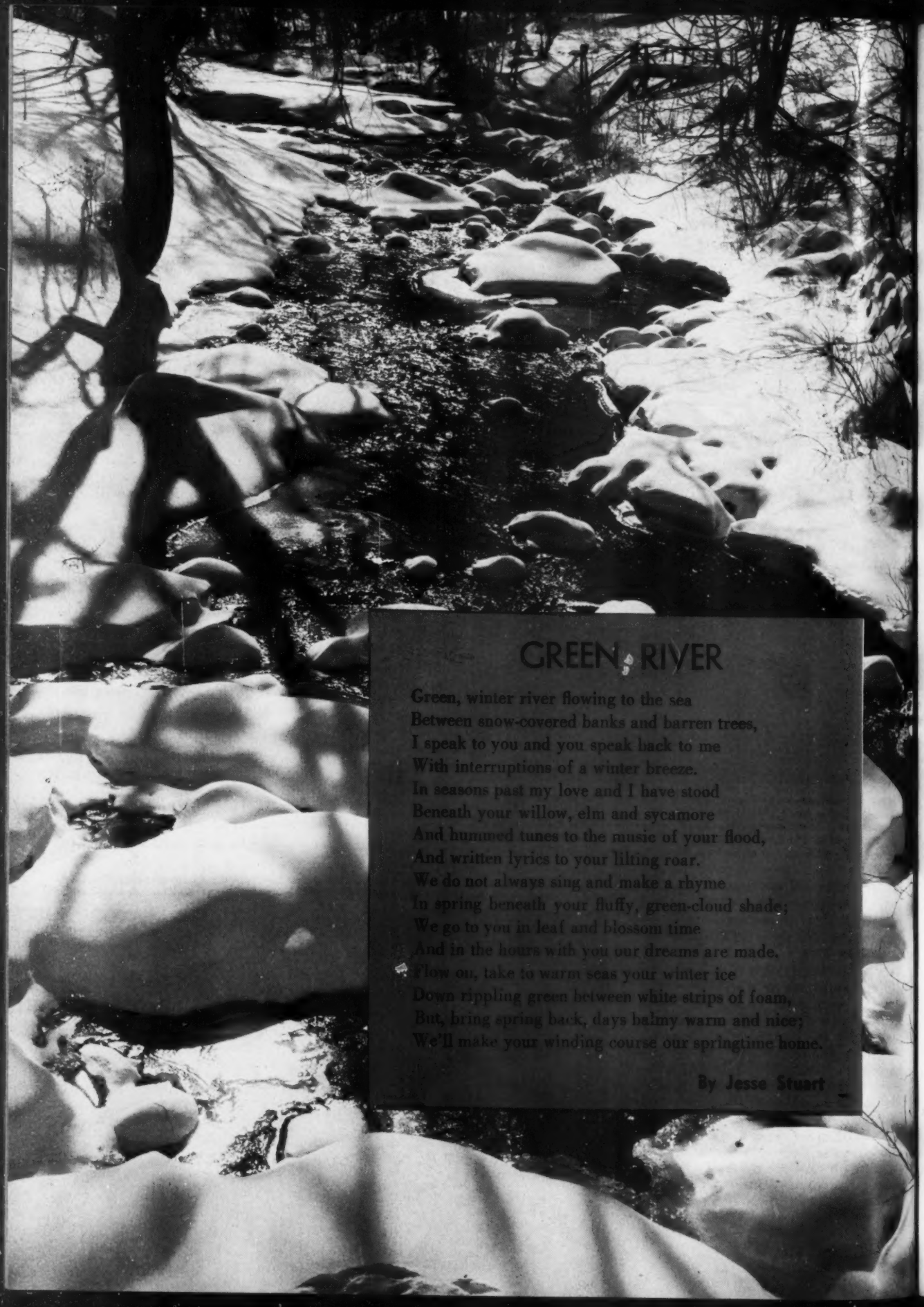
This relationship closely approximates the present one of 57 percent hardwood to 43 percent pine, as revealed by the Forest Survey. However, there is a great difference between the hardwoods in the original forests and those now so aggressively taking over pine areas. The trees growing in the original forests were generally fine specimens which yielded high quality lumber. In the uplands huge oaks, chestnut, and hickory dominated the forest. In the lowlands, adjoining streams and watercourses, occurred magnificent stands of sweet gum, black gum, yellow poplar, white oak, and ash. Abundant on both uplands and lowlands were numerous other species of hardwood of lower market value. Some of these were beech, maple, magnolia, ironwood, water oak, and willow oak.

Although valuable hardwoods are still found on natural hardwood sites, the quality of those taking over pine sites is generally poor. In the first place they are not, for the most part, desirable species. Southern red, water, laurel, and several kinds of scrub oaks are the most common. In the second place hardwoods of desirable species, which make rapid growth on hardwood sites, show much slower growth on pine land. For instance, red gum, splendid tree that it is on bottomland, makes indifferent growth on pine sites and has a definite susceptibility to butt rot. Lastly, where invading pine forests, hardwoods comprise an understory. This results in a stand of large valuable trees, the pines, under which is growing a subordinate stand of small trees of inferior species, the hardwoods. Clearly the loggers' interest will center on pine.

During the early days in the development of the South, settlers cleared vast acreages of forest as a means of obtaining fields to cultivate. Land was limitless. As soon as a field lost its virgin fertility, another was carved out of the forest wilderness. Invariably the abandoned cultivated land reverted to forest, and, except in the rice plantation country, where various species of gums prevailed, the new forests were usually pine. Where conditions were favorable, all the southern pines regenerated readily. On recently abandoned agricultural lands, conditions were perfect, the soil being bare and unshaded. Pine seeds equipped with efficient wings

(*Turn to page* 50)

Figure 5. This forest was originally mixed pine, hardwood. Cutting pines literally made a present of the area to hardwoods—in this case ubiquitous southern red oak



GREEN RIVER

Green, winter river flowing to the sea
Between snow-covered banks and barren trees,
I speak to you and you speak back to me
With interruptions of a winter breeze.
In seasons past my love and I have stood
Beneath your willow, elm and sycamore
And hummed tunes to the music of your flood,
And written lyrics to your lilting roar.
We do not always sing and make a rhyme
In spring beneath your fluffy, green-cloud shade;
We go to you in leaf and blossom time
And in the hours with you our dreams are made.
Flow on, take to warm seas your winter ice
Down rippling green between white strips of foam,
But, bring spring back, days balmy warm and nice;
We'll make your winding course our springtime home.

By Jesse Stuart

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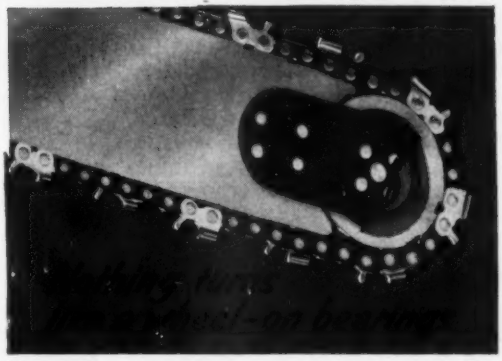

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Reading About Resources

(*From page 5*)

"The published Proceedings of this Conference held 49 years ago had a greater influence upon me than perhaps any other paper or book I have read."

IRA N. GABRIELSON, *President, Wildlife Management Institute.*

Dr. Gabrielson

"Monroe Bush's request for a short statement on a book or books that had some significant influence on my interest in conservation caused me to do a lot of mental reviewing before I finally settled on a book which more than any other stimulated my interest in the conservation of wildlife.

"Conservation books were scarce in my boyhood, and until I went to college, library facilities were meager. During the time I was in school, I was wrapped up in biological work and in the necessary studies to complete my schooling. I had neither time to read nor the money to accumulate many books. I had read some conservation articles and occasionally something from William T. Hornaday.

"Just after I graduated from college, his book, *Our Vanishing Wildlife,* which was published in 1913, fell into my hands. It was the first attempt I had found to assess the condition of the populations of birds and mammals in which I was already deeply interested. The list of those that were exterminated or nearing extermination seemed appallingly long. When I reviewed the part that applied to the country with which I was familiar, it seemed to me that it was somewhat exaggerated; but there was still enough truth in it to stir in me a profound conviction that people who were interested in these resources should do something to help protect them.

"Many of Hornaday's doleful predictions did not come true due perhaps to the interest stimulated in people by his crusading type of writing and by the growing army of people who began to be actively interested in better management of our resources.

"This book made many enemies for Hornaday because he pulled no punches and, where he thought it was necessary, named names and places. The book as I see it now is not great writing but it certainly is forceful and it did assemble a lot of facts and opinions in one place where they were accessible to the youngsters like myself who were interested in the wildlife. I have no way of knowing how much he stirred other people, although I did meet a number of young men about my age who became more actively interested in conservation work largely from reading this book. It, therefore, had some influence regardless of its flamboyant style and sometimes rather wild and sweeping generalizations.

"As I look back, I believe that that type of thing was quite necessary at that time. It may be that occasionally a book of this kind is good medicine because we often become so interested in details that we tend to overlook the broader implications and the broad picture. In my opinion, this situation does not exist to the extent that it did when I was a boy, but there are still plenty of people interested in the resources who are rather inclined to sit on their hands and figure that everything will work out for the best regardless of whether they help or not. Such a book as Hornaday's applied to modern conditions might help, just as his helped me become interested in better management of our wildlife and other natural resources."

JOSEPH WOOD KRUTCH, *author and critic, formerly professor, Columbia University.*

Mr. Krutch

"The books which have influenced me most are those which have most clearly defined in terms meaningful to me what it is that is most worth conserving. That means, first of all, Thoreau among the older writers, Aldo Leopold among the more recent. It is chiefly because of the values they so eloquently defended that I came later to be interested in the 'how' as well as the 'why' of conservation. They taught me to love what Vogt, Sears, Harrison Brown and others have frightened me into a public concern for. And I still feel that any real conservation must be motivated by love at least as much as by prudence."

PAUL B. SEARS, *Chairman, Conservation Program, Yale University.*

Mr. Sears

"My own interest in resoures and their conservation has been a matter of slow increment, beginning almost before I can remember. There was an interest in natural history in my home, among our circle of immediate friends and a few of my early teachers.

"In college I studied under an excellent zoologist, Edward L. Rice, and a fine geologist, Louis N. Westgate. In 1912 our professor of economics, George G. Groat, introduced us to the then new *Conservation of Natural Resources* by Van Hise, with lasting effect.

"There is, I believe, a medical maxim that more mistakes come from not looking than from not knowing. So I suppose that any book which encouraged me to observe had its effects. This list would begin with Asa Gray's *How Plants Grow* and certainly include Thoreau, as well as more technical works. I have certainly enjoyed Conrad Richter's *Trees,* confirming as it does my grandfather's account of the primeval forest.

"John L. Riddell's account of the Ohio prairies and his *Flora of the Western States* (1835) gave me a means of measuring subsequent change, as do some of Willa Cather's writings on Nebraska. Aldo Leopold's *Sand County Almanac* I regard as a masterpiece while Ellsworth Huntington's widely criticised books on climate and its effects have at least been a stimulus and challenge. Also F. Fraser Darling's books on northern Great Britain seem to me to display great insight.

"Of course, to the scientist concerned with natural resources the arousing of interest and concern is

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only a beginning, to be followed by scrupulous and impersonal labor. For half-truths and good intentions can be peculiarly disastrous in this complex field."

OLAUS J. MURIE, *President, The Wilderness Society.*

Dr. Murie

"As a youngster just after the turn of the century I was tremendously stirred by Seton's *Two Little Savages,* setting forth heavenly experience similar to the kind of life we kids were having along the Red River. The *Leather Stocking Tales* of Cooper were extremely important, and Dillon Wallace's books on Labrador, to us who were playing Indian. Later I was absorbed by Shakespeare's plays. Then of course came the period when I was immersed in all the biological journals, on birds, mammals and general science, and I still keep up with these. Among inspirational books I have liked Henry Van Dyke, John Burroughs; also Anne Lindbergh. Among explorers I have been impressed with *Farthest North* by Fritiof Nansen, and *Kristin Lavransdatter* by Sigrid Unset and *The Long Journey* by Johannes V. Jensen. I have been more recently much interested in the sociological field as related to conservation, and the writings of Ygasset (*Revolt of the Masses*), Erich Fromm (*The Sane Society*), and Lillian Smith (*Killers of the Dream*). Of course I have followed all conservation writings and been especially inspired by Aldo Leopold, Louis J. Halle, and Joseph Wood Krutch.

"But all this is merely random selection out of a great number. I cannot point to any book, or any few books; so many have been important to me."

SIGURD F. OLSON, *President, National Parks Association.*

Mr. Olson

"Thoreau's *Walden Pond* put the world in such clear cut perspective that I realized even as a boy that what really counted in life was to look at the out of doors and humanity through the calm, analytical, and often mystical eyes of the sage of Concord.

"Henry Van Dyke in his *Days Off* not only gave me a sense of intimate communion with nature, but an acquaintanceship with beautiful and poetic prose.

"John Burroughs in homely, reflective philosophy, particularly in *Indoor Studies,* answered many things in my groping for meaning in the world about me.

"And there were many others, John Muir, Emerson, London, Hudson, Wordsworth, Cooper, and Seton; but as I look back, if I were to pick only one, it would be Thoreau's *Walden Pond,* for to me, here is the distillation of them all as well as the great minds of all the centuries."

Note: Readers whose interest and service in conservation have been stimulated by some particularly powerful book, are invited to submit a personal statement of approximately 100 words, together with snapshot, neither of which can be returned. Those statements of particular interest to the readers of AMERICAN FORESTS will be published from time to time in subsequent issues of this department. Address all contributions to:

"Reading About Resources,"
AMERICAN FORESTS,
919 - 17th Street, N. W.
Washington, D. C.

The Oregon Checkerboard—Twenty Years Later

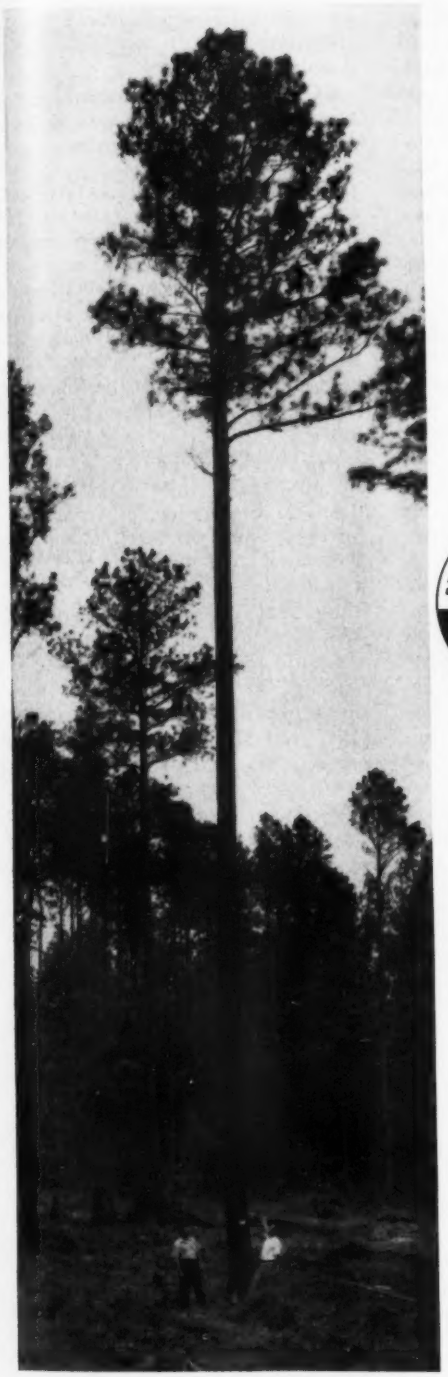
(*From page* 13)

quired to pay only its share of the cost of maintenance.

In a number of situations access to large areas of over-mature O&C timber can be provided at the time needed only by government financing of the necessary roads because of the very heavy costs of construction. Here again the O&C counties recognized the soundness of capital investments to increase the income earning capacity of these lands. They voluntarily agreed to the retention by the government of a portion, not exceeding one-third, of the income otherwise payable to them, on condition that it be used to reimburse the U. S. Treasury for appropriations to finance the construction of timber access roads. Under this arrangement 21 million dollars otherwise payable to the counties has been appropriated to provide access roads. Most of this has gone into new construction but some of it has been used to acquire rights-of-way and existing privately-constructed roads. One hundred fifty miles of high standard roads capable of supporting year-round use by the heaviest logging trucks have been built or are under construction. Location surveys for several hundred miles more are in progress.

On August 28, 1957, the 20th Anniversary of the O&C Sustained Yield Management Act, a group of people including the members of the main O&C Advisory Board made a field trip through an area where logging began in the early days and has continued ever since. Fine stands of young second-growth timber ranging from very young trees all the way up to 100-year-old stands are prevalent on the intermingled O&C and private tree-farm lands. Much of this young timber came from seed trees which were left on the O&C lands for the purpose of reseeding the cutover areas. In certain places recent cutover land has been successfully restocked with young trees by the sowing of selected high yielding strains of Douglasfir seed which was treated with rodent-repellent poisons developed by the Fish and Wildlife Service.

An operation typical of second-growth timber management was visited on the 20th Anniversary field trip. Selective cutting was in progress on 120 acres of Douglasfir in which the average age is about 100 years. Management plans call for the main harvest of the stand in another 15 or 20 years. Approximately 17 per cent of the volume was in trees which were overtopped and partially suppressed by the dominant trees of the stand. The growth rate of these partly suppressed trees, as revealed by increment borings, had fallen to a low level. All or most of them could be expected to die, one by one, and their value be lost before the end of the 20 years of waiting for the main harvest. Consequently, they were marked for cutting and sold. The revenue gained by this loss prevention cutting



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amounted to $22,000. This was made possible by favorable markets and a permanent road system.

Timber on the O&C lands, including both present and future stands, is retained as federal property on mining claims whether patented or unpatented. Miners are permitted to use timber free of charge for mining purposes but the government, under legislation enacted on April 8, 1948, retains the prior right to manage and sell such timber even after the subsurface resources become private property.

Originally a million acres of the O&C lands were located inside the boundaries of the national forests where they were intermingled with alternate sections of national forest lands. There was an extensive overlap in the jurisdictions of the Bureau of Land Management in the Department of the Interior and the Forest Service in the Department of Agriculture. Half of this million acres had not been patented to the Oregon and California Railroad Company prior to being returned to federal ownership. Because of this, the Forest Service considered this half-million acres to have national forest status. For many years, therefore, both bureaus claimed jurisdiction to a half-million acres of the same land.

By an agreement between the two bureaus, money derived by them from timber sales on the controverted land was placed in a special deposit account to await the outcome of legislation which had been introduced to settle the jurisdictional status of these lands. The legislation was in Congress for more than ten years. Finally one of the O&C counties brought suit to require distribution of the income which had been placed in the special deposit account. When the suit reached the District of Columbia Court of Appeals the court decided that the lands in controversy were O&C lands.

At that point Congress finally found it possible to act. On June 25, 1954, it confirmed the court decision by declaring that the controverted lands are O&C lands. Jurisdiction of this ½ million acres was awarded to the Forest Service with the requirement that past and future income collected by that bureau be deposited in the special O&C fund of the Treasury for distribution by the Department of Interior, under the distribution plan of the O&C Act of August 28, 1937.

In this same legislation Congress required that the Bureau of Land Management and the Forest Service carry out a land exchange to cure the overlap in jurisdiction between the other half million acres of O&C land and a corresponding acreage of national forest. This exchange which was consummated in June 1956, cured the major overlap in jurisdiction between O&C lands and national forest land. Part of the Oregon checkerboard was folded up but there is plenty of room for more moves.

Prior to the O&C Act of August 28, 1937, fears were expressed that the lack of a management program for these lands would stifle the management of the national forests and private forests of western Oregon. Those fears are no longer expressed. The change is due to the positive program of forest management, including the development of roads providing access not only to the O&C timber but to large areas of other public and private timber.

Horseback Holiday

(*From page* 16)

riety of trees, shrubs, and wildflowers through which we rode each day. Trees alone number over 130 species. I was reminded many times of my conversation with Jack McCormick back at the museum. Tulip trees over twenty feet in circumference, hemlocks and cucumber trees nearly as big, and buckeyes and yellow birches well over ten feet around —these were not uncommon in virgin stands.

Sometimes we rode through cool shaded vales where trillium, lily of the valley, and pink lady slipper grew beside quiet streams, and hemlocks reached 100 feet above us. Other trails wound in dappled sunshine through young hardwood forests, the light glinting on the curled bark of yellow birches. From such a woodland we often found ourselves coming suddenly into a meadow that rose abruptly to a treeless summit carpeted with masses of flowering bluets.

These open summits, or "balds" as they are called, are subjects of mystery. When were they cleared? Or were they never forested? No one seems to know. It has been suggested that Indians first cleared them long ago for campsites that would be protected from attack, and that early settlers continued to use them for pasturage. My suggestion—that we had simply climbed above the timber line—evoked a good-humored guffaw from Todd who pointed to nearby higher mountains that were covered with spruce and fir.

It was in those dark somber forests of the higher peaks that I felt we had truly left the world behind. A gray-green moss blanketed every rock and fallen tree to a depth of six or seven inches, and even the occasional patch of sunlight that filtered through the dense evergreen mantle above us could not dispel the chill dampness from the air. In a forest of this type near the crest of Mt. Sterling we saw several trees on which bears had left deep claw marks, some as high as eight feet. "It's supposed to be a signal to other bears," Todd explained, "sort of like 'Kilroy was here.' The height of the scratches shows the newcomer how big his rival is."

Whether it was with amusing folk lore or scientific fact—and the two are not always incompatible, I learned—each day brought us new awareness and a hundred new experiences. Take the day we rode to Purchase Mountain.

The sky was cloudless as we left the ranch and climbed the winding trail to Double Gap where it joins the high ridge known as Cataloochee Divide. But as we approached the crest of Purchase, dark storm clouds were looming ahead. "We'll try to make it to the top before the rain," Todd told us. "The view is worth it."

Strong winds flattened the grass as our horses broke into a canter and spread out across the open slope. I knew that Two Bits shared my feeling of exhilaration in that race to the summit. Perhaps he also shared my sense of humility and awe as we sat in silence for a few moments at the top. Before us row on row of blue-gray ridges, stretching to the horizon, were bathed in the soft smoky haze from which the mountains take their name. There are loftier, more imposing ranges in North America, but none more benign. The grandeur of the Great Smokies is a mantle of dense and varied vegetation that springs from

far back in geologic time, for this rolling verdant range is one of the oldest uplands on earth.

Lightning jabbed the mountains in the distance, reminding us of the approaching storm, and we headed for an abandoned cabin nearby that Tom had selected for our lunch site. Wranglers Hershel Bryson and Dude Frazier were stirring the big pots of spaghetti and meat sauce that steamed over the outdoor fire. We barely had time to tie our horses, throw our ponchos over the saddles, and "dish up" before the rain began—a pelting downpour punctuated by lightning and crashing thunder.

Crowded together on the cabin porch, we savored our hot lunch and listened to Tom's stories of mountain men and their battles with the elements. At one sharp clap of thunder, a horse that had been tied to the post railing bolted suddenly, pulling the rotten beam from its place. The porch shuddered and for a moment it seemed that the roof would collapse over us, but the uprights held fast. The horse was unhurt and as Tom retied it to a tree he called, "In case you're worried, the horses don't mind storms. The rain even feels good to them on a hot day. When this trip is over they will go into pasture for a week or ten days, living as much in the open as wild animals."

The rain had subsided to a mild drizzle when we started back. Our ponchos billowing in the wind, we splashed through dripping foliage and swollen streams on the steep grade to Cataloochee Divide. Looking up the trail ahead, I saw that our line was moving in a bank of white mist; it was steam rising from the flanks of the horses as they climbed laboriously, slipping and regaining their footholds in the soft mud.

By now we had begun to speak the lingo of Cataloochee, and we sat around the huge stone fireplace at the ranch house in the evenings talking horses and history. The two have always gone together here. Even with the advent of the automobile, many communities remained relatively isolated—horseback being their only mode of travel. Our saddle trip did not take us to any of the few such communities that remain inhabited to this day, but we saw others that had been abandoned within living memory. One of these was "The Deadenin,'" a quiet valley meadow ringed by mountains. The name derives from the way in which the first settlers cleared the place: girdling trees with ax cuts so that they died standing. Mrs. Gazzie McGhee Underwood, our ranch housekeeper, who was born at "The Deadenin'" a few years before the turn of the century, recalled that her people had little need for contact with the outside world. They took care of their own births and deaths, and a few times a year the head of a family would go on horseback over the mountains for sugar, coffee, and yard goods. In this relative isolation they preserved many strains of their Old World heritage, and even today the rural culture of the Carolina highlands—colorfully expressed in folk songs, dances, and legends—is clearly cast in the mold of Elizabethan England.

We heard many of these legends, joined local visitors at the ranch in rollicking square dances, and—to the accompaniment of Judy Alexander's guitar—sang the sometimes mournful, sometimes funny, always enchanting folk ballads.

The night before we were to set out for our encampment in the

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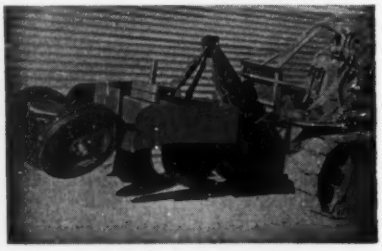

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woods, Tom showed us movies of former camping trips. "Please notice," he said, "that the women are doing most of the work. That's the tradition around here and we like to maintain it." But we were used to Tom's humor by then and could return it in kind. All right, we told him, but each of us gals would require an extra packhorse to carry our dresses and petticoats, cosmetics and mirrors, and other traditional feminine paraphernalia.

As it turned out, the encampment was primitive in every sense and, for some of us, a first taste of real pioneer life. Our site was on the bank of Pretty Hollow Creek, between Indian Ridge and Butt Mountain. We slept on the ground under tarpaulin lean-tos, washed in the creek, and all shared in the daily chores of camp life—feeding and watering the horses, food preparation, dishwashing, and the like. The work went quickly, leaving us long days for riding and evenings around the campfire where we became acquainted with the wit and wisdom of our camp cook, Sam Woody.

Sam is one of the last real mountain men. A life of lumbering and guiding in the Smokies has given him an intimate knowledge of the mountains and their inhabitants, both human and animal. He has never resented the intrusion of outsiders, but he enjoys a chance to remind us that the skills of his way of life cannot be learned overnight by newcomers. The fishing was a case in point.

Two of the men in our group had bought fine new fishing rods in Waynesville with the hope of catching rainbow trout in Pretty Hollow Creek. Sam looked over their fancy tackle, wished them luck, and waved them off upstream as he headed downstream with his home-made rod. In less than an hour Sam was back with five trout (the day's limit in the park); and there was a triumphant, though not unfriendly, twinkle in his eye when—some hours later—the other two slunk sheepishly into camp without a single fish!

One night Sam's trout catch of the previous day disappeared. It had been stored in a bucket near the spring, and some of us suspected others of having enjoyed a private fish fry in the small hours of the morning. But these suspicions dissolved in a flurry of excitement and mild anxiety when, on the following evening, a large black bear waddled nonchalantly past the camp en route to the garbage pit. We watched from a distance, our flashlights beamed on the unconcerned visitor as he poked his nose into empty cans and jars. "They won't bother you if you stay away from them," Tom said. "Just don't ever try to feed them by hand."

Arthur Stupka, the Park Naturalist, who came to our campfire one night, told us of the trouble park authorities have had with bear-feeding tourists. "No matter how tame and friendly a bear may seem, he's still a wild animal and a powerfully strong one. Every year we have a few visitors to the park who insist on learning that the hard way."

Except for bears, most of the larger animals that once roamed the Smokies have disappeared, Mr. Stupka told us. Eastern buffalo and elk were common here in Indian times, and panthers were a familiar danger to the settlers of a few generations back. Even the white-tailed deer, plentiful until fairly recently, is found now only in isolated areas. And, as elsewhere in the country, the wild turkey—deprived of its main source of food by the chestnut blight—is also dying out.

Many times, as we rode through the forest, we passed the great grey forms of dead chestnuts. The strong bleached wood, unrotted twenty or thirty years after the tree's death, made splendid fuel for our fires. As we watched Dude Frazier, mounted on a big black mare, "snaking" the weathered logs into camp, we had another glimpse of lumbering days in the Smokies. With one end of the rope tightened around the saddle pommel, horse and man hauled the huge trees across the stream and up the embankment in a series of abrupt, powerful charges.

Horses were, indeed, essential to life and work in the early settlements here. Today they far surpass the automobile in making possible a full enjoyment of the park—especially of the great mountain wilderness that one could never traverse on foot in ten days.

As we neared the stable on our last ride back to the ranch, Two Bits lost a shoe. It was well worn and Tom told me to keep it; it would remind me to come back. A few minutes later we led the horses to the pasture gate where I thanked Two Bits for a memorable vacation and watched him bound joyfully off through the rhododendron bushes. I'm keeping his shoe for a good luck charm—a token that another AFA saddle trip lies ahead in the Great Smokies.

Mrs. Jane Evans

AFA Business Manager Named

AFA's Board of Directors has appointed Mrs. Jane Evans as business manager for the association. Mrs. Evans, an AFA staff member for three years, succeeds Robert B. Spencer. Prior to joining AFA, Mrs. Evans worked as an accountant for two years in New York, and taught one year of high school and one year at a business college. She is a graduate of Christian College, Columbia, Missouri, and the University of Kentucky, where she received B.S. and M.A. degrees. While attending the University of Kentucky, Mrs. Evans was initiated into Delta Phi Epsilon, an honorary business graduate fraternity.

Yankee Forester

(*From page* 17)

his other duties. At another time he was state geologist, and from 1941-44 he was president of the National Association of State Foresters. He was also chairman of the Vermont State Planning Board at its inception, and among many other offices he holds that of Justice of the Peace, an official with very unusual powers in the state of Vermont. For example, justices receive appeals on tax assessments which can be reduced if they believe they are unjust.

Merrill is in his office, located in a small white cottage about a block

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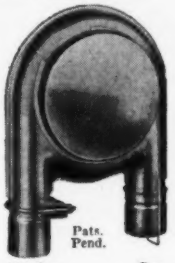

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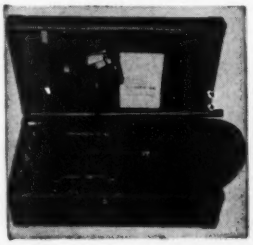

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from the Capitol Building, at seven-thirty every morning, and by nine-thirty, about the time big city sluggards are just getting organized, he has answered all his mail, had half a dozen interviews, and is down at the filling station getting his tank filled up for a long tour of inspection throughout the state — a tour which may not get him home till eight or ten at night, if anything special comes up. As he remarks rather plaintively, he almost never gets to weed his garden any more.

However, this schedule is only good when he isn't flying to Washington or Seattle or Atlanta or Toronto to attend a forestry conference The Merrills live in a large white house not far from his office. Three of their four daughters are married, and Merrill recalls that every year for the past twenty years they have had at least one daughter in college somewhere.

Forester Perry Merrill takes a truly exhaustive view of his extraordinarily diverse job. Thinking of the younger grade school kids who are born and grow up in Vermont but often have no really well-informed natural history instruction, he runs a Conservation Laboratory for ten days every summer to which 25 grade school teachers from all over the state are invited. These are teachers who take classes on field trips into the forests—but who often are quite as ignorant of the processes of nature as their pupils. Merrill and an assortment of state officials not only give lectures, but take the teachers themselves on field trips —teaching them how to teach conservation. During these ten days they are housed in the State Ski Dormitory at Smuggler's Notch in the Mt. Mansfield State Forest. For older children there is an annual Forest Essay Contest with several hundred dollars in prizes.

Two-thirds of Vermont is covered with forests today, and in a sense its trees are the state's most valuable product. For their beauty not only attracts so many visitors that recreation is now its most profitable single industry, but they also furnish the raw material for some 500 woodworking industries. These plants are surprisingly specialized; one producing nothing but golf tees, another clothes pins, another skis, another flat wooden ware, another hardwood plywood, etc., etc. The state's major woods are sugar maple, birch, beech, bass, hemlock and white pine.

As for skiing—and operators now have well over a million dollars invested in ski lifts alone in Vermont —Merrill had a hand in developing this activity, too. It came about this way. From 1933-1940 he was state administrator of the Civilian Conservation Corps, an institution he feels has been much maligned. In his charge were thousands of young boys from several states, many of whom were ill-fed and in very poor physical shape. Provided with solid food by the Army and heavy outdoor jobs by Merrill, these lads not only developed into fine physical specimens, but cleared ski trails and built dorms in the Stowe ski area—which now does a $3,000,000 business a year. Today motels and lodges can sleep 2,000 in the area, and often as many as 10,000 visitors are accommodated by the ski lifts in a single day. Some slopes here can guarantee skiing every day between given dates, so that visitors fly in from all over the eastern U.S.

In addition to all the usual functions of a state forestry department, Merrill's department has in recent years kept on the staff a marketing assistant who travels about the state advising small sawmills on how to get the best value from their logs, and protect them against insects and damage. His feeling is that a Forestry Department should provide a complete service to timbermen at all times.

However, sometimes he finds himself involved in some unusual and even baffling projects. Take the matter of porcupines. For many years the state of Vermont paid a bounty of forty cents for every pair of porcupine ears presented to a town clerk, the animals being declared a menace to agriculture. Well, you know how people are. It turned out after a while that some industrious characters were manufacturing "ears" from the animals' stomachs — and the sum the state was paying out yearly climbed from $15,000 to $18,000 to $20,000—so the legislature withdrew the offer, and instead presented Merrill with a flat $10,000 with instructions to "control porcupines." "As yet," Merrill remarked recently, "I haven't figured out how this can be done."

Perry Merrill's biggest upcoming activity will be chairman of the Champlain Anniversary Festival in 1959, commemorating the 350th anniversary of the discovery of Lake Champlain in 1609, by Samuel de Champlain. Plans are still tentative, but it is expected that both Vermont and New York will stage elaborate historical pageants.

Sentiment Grows for Repeal of P. L. 587

(*From page* 25)

ownership of each in order to give the Forest Service maximum flexibility in management under the Netzorg plan.

Small landowners and timber operators in Oregon, who were reported to be not too pleased with the Weyerhaeuser plan, last month were looking on the Netzorg proposal with more favor. Of some significance, however, is the fact that the Indians involved who must agree on a solution did not like either plan. A number of Indians at the Neuberger hearings said they were not in favor of P.L. 587 as it was finally passed. These Indians are inclined to think the law should be repealed. Yet another group wants to see the timber sold in small parcels on a liquidation basis.

With no single plan gaining universal acceptance up to this time, sentiment in favor of repeal of P.L. 587 continues to grow. The basis on which the law was passed in the first place was that the Indians are now ready to meet their responsibilities. Yet, they are having all manner of difficulty in meeting their first acid test in this respect. Also, more and more people are calling attention to the fact that the Indian Service certainly cannot be faulted on its management of the Indian timber.

In fact, a number of professional foresters including AFA's Chief Forester have publicly called the management program of the Indian Service "first rate."

Fertilizing Forests

(*From page* 23)

Experiment Station a slash pine plantation will be fertilized, also irrigated and cultivated, to determine whether these cultural practices will increase yields of turpentine and rosin. Here also foresters are fertilizing young slash pine forests in an effort to stimulate seed production at an early age. A similar study of stimulating seed production of longleaf pine as well as of slash pine is under way in Louisiana. Near Tifton, Georgia, a young slash pine plantation is being treated with nitrogen, phosphorus, and potassium at different levels and with minor elements and calcium. And in Mis-

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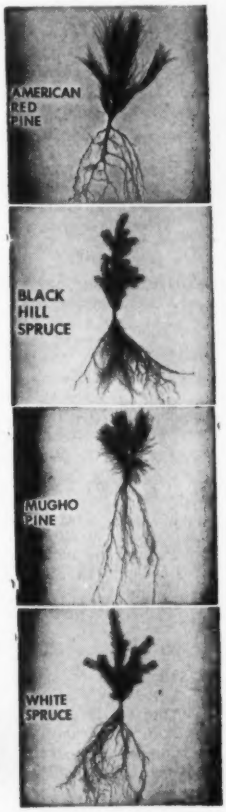

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sissippi growth and survival of loblolly pine planted on loessial soil and on Coastal Plain soils are being compared under different levels of application of nitrogen, phosphorus and potassium, along with minor elements.

Not all the work is concerned with pines, either. In a cooperative study with the North Carolina Wildlife Resources Commission, foresters are testing the possibilities of increasing acorn production for game food by fertilizing scarlet and white oak at different rates. Another study about increasing the mast production and the growth of white oak is in progress in Indiana with the cooperation of Purdue University and the Central States Forest Experiment Station.

In the West, foresters of the California Station and the Pacific Northwest Station are trying to determine whether they can consistently increase the seed crops of Douglasfir and of sugar and ponderosa pines and the growth of Douglasfir plantations on poorer sites by fertilizing.

The other phase, the nutritional requirements, is also being studied by the Forest Service as well as by forest schools or universities. Researchers at the University of Washington, at Ohio State University, at Yale University, at Michigan State University, and at the University of Maryland, to mention a few, are trying to determine the nutritional requirements and deficiency symptoms of a number of tree species. Descriptions of these deficiency symptoms, particularly when accompanied by color photographs of transparencies, are extremely valuable in the diagnosis of the nutritional needs of nursery and forest trees.

Equally important are studies aimed at finding out how much of a given nutrient a tree can use effectively in growth. An example of such a study is one in progress at the University of Maryland in cooperation with the Northeastern Forest Experiment Station. Here loblolly and Virginia pines are being grown in sand culture with different levels of nitrogen, phosphorus, potassium, calcium, and magnesium to find out how the trees respond to the amount of the nutrients available. The amounts of the elements in the needles of the trees are being related to the amounts of the elements being supplied and to the growth of the trees. This information will provide a basis for judging by foliar analysis whether trees growing in the forest are adequately supplied with nutrients. So far the studies show a definite response to too little—and too much—nitrogen, a low requirement for phosphorus, and a nutritional upset, indicated by needle discoloration, related to the magnesium-to-calcium ratio.

After researchers find out how much and what kind of nutrients a tree requires on the many kinds of soils, there still remains the problem of applying the fertilizer. Aerial application has been used in tests in New York State and blowers have been tried in Europe. Foliar application as a means of supplying the trees without giving competing ground vegetation a boost, too, needs testing. Experiments have shown that fertilizers applied at the time of planting often so stimulate grass and herbs that they suppress the trees, particularly conifers. And finally the costs of the treatment will have to be justified by increased yields of lumber, pulpwood, or other forest products. When all these data are accumulated, silviculturists, like agriculturists, may very likely find that fertilizing, in some areas, is a necessary part of intensive management.

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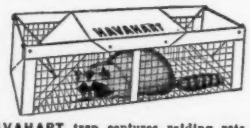

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AFA DIRECTOR DIES AT AGE 63

GEORGE W. MERCK, director and devoted friend of The American Forestry Association, died last month at the age of 63 of a cerebral hemorrhage, in West Orange, New Jersey.

Mr. Merck was chairman of Merck & Company, manufacturing chemists, and was a world leader in the chemical and pharmaceutical fields. Under his direction, his company assisted in the development of penicillin, streptomycin and cortisone.

During World War II, Mr. Merck served as a special consultant to Secretary of War Patterson on biological warfare. In 1944, he became chairman of the United States Biological Warfare Committee. For his efforts he was awarded the Medal of Merit, the highest civilian honor awarded by the government. In 1951, President Truman appointed Mr. Merck as a member of the National Science Foundation, and was reappointed by President Eisenhower in 1954.

Mr. Merck received the Chemical Industry Medal in 1947, and was designated as "industrialist of the year" in 1953 by the Society of Industrial Realtors.

George W. Merck

Mr. Merck was also deeply interested in conservation, as evidenced by his many years of outstanding service as a member of AFA's board of directors. He was on the board of The Conservation Foundation, a trustee of the Dawes Arboretum and the Vermont Forest and Farmland Foundation, Inc.

JOHN B. WOODS—FORESTER

THE death of John B. Woods, Sr., on September 3, brought to an end the distinguished career of an outstanding forester. For 45 years he had directed his versatile abilities to those problems of most importance to the establishment of forestry in the nation, and in each had made contributions that have promoted the broad movement of forestry throughout the country.

The American Forestry Association appointed Mr. Woods as director of its Forest Resources Appraisals, to assemble information upon which to base a postwar national forestry policy. Mr. Woods' skill and effectiveness in gathering and interpreting the needed data made possible the sound and widely accepted Program for American Forestry for which AFA now stands.

Mr. Woods began his forestry career under the guidance of Dr. Carl Schenck at the Biltmore Forest School in 1912. While with the school he studied in all of the major forest regions of the United States, and spent six months in Germany visiting the important forests and forestry schools there.

Mr. Woods was particularly noted for pioneering forest enterprises in private industry. During his many years of service with Long-Bell Timber Co., he was able to put into practice his theory that reforestation was the answer to the growing demand for timber.

Later he accepted a position in the Timber Section for the Lumber Code under the NIRA, where he was active in writing forest practice rules for every timber region, and in securing their adoption by cooperating regional associations. These rules, modified and strengthened, are today in effect in most regions, either by industry concent or by law.

Mr. Woods was also a skillful and versatile writer. He was a frequent contributor to *American Forests* and technical journals.

Shelterbelts

(*From page* 19)

pride. "In fact, I call this my 'monsterpiece.' Anyhow, it's slated for publication as a technical bulletin by the Great Plains Agricultural Council."

"Where can I get a copy—and how soon?"

"It should be off the press by the end of '57. And as for distribution, free copies of the bulletin will be available through the council, or from the Rocky Mountain Forest and Range Experiment Station in Fort Collins, Colorado."

"Now, to get back to the windbreaks again, what factor had the most effect on tree survival and growth?"

"Offhand, I don't know that I can say just which factor has been most important. Most of them overlap. Site condition is certainly one. By site, I mean variation in soils—variations in depth, texture, pH, permeability, and moisture content of soils—together with slope, topography, water table, and other things that make up a plant's environment."

"You mentioned other factors. What about cultivation and protection?"

"That's right. Early cultivation was important. Neglected plantings soon became choked with weeds and sod. Trees were stunted and many died. Grazing and trampling by livestock also ruined some of the plantings, particularly in the Southern Plains. In our regionwide survey, we found that 30 percent of the sample windbreaks had been seriously damaged by livestock."

"In brief, what are some of the other highlights of the survey?"

"For one thing, Elmer, we learned a great deal about species—which ones can stand the gaff, where they are best suited, and of course some that were failures. In addition, we have gained much valuable experience to guide us in designing future plantings.

"For example, we found that conifers — especially the pines and red cedars—generally did better than expected. Eastern red cedar was the best conifer regionwide. Ponderosa pine and Austrian pine, although low in survival and slow growing, turned out to be excellent windbreak trees, once established.

"We've also learned that some plantings were wider than necessary.

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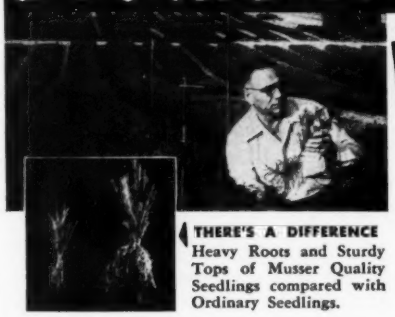

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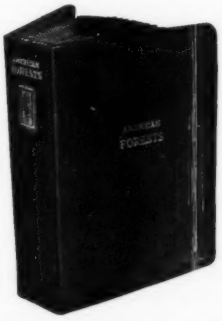

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A few owners are reluctant in keeping a strip of land 80 to 120 feet wide out of crop production. Where land is currently valued at close to $200 an acre, this attitude is understandable. Farmers find that trees also sap soil moisture from adjacent crops. The narrower 3- to 5-row windbreaks, particularly when conifers are adequate, are more efficient than anticipated.

"One other point—the survey showed that plantings too close to roads can cause trouble. Although roadside plantings improve the scenery, they frequently interfere with power and telephone lines, obstruct the driver's view at intersections, cause drifting snow to pile up on roadways, and increase the chance of damage by fire.

"Of course, there are other highlights—perhaps minor—and plenty of sidelights, too, but you asked me to keep it brief!"

I realized that Ralph was right. A person can't very well squeeze the results of 20 years of shelterbelt experience into a 5-minute capsule. So I thanked him and asked to borrow a copy of the king-sized manuscript. I wanted to dig out for myself some of the statistics on the 40 species evaluated in the survey.

In most windbreaks, five main classes of plants were used. *Tall, fast-growing trees* were planted to provide a backbone of quick protection and height. *Tall, slower-growing trees* generally flanked each side of the middle rows. *Short, fast-growing trees* were planted on the outer edges of the windbreak, usually on the leeward side. *Shrubs* were used in outside rows as low-level barriers on the windward side. *Conifers* were often planted between the shrub rows and the taller trees.

These five classes were usually arranged in rows designed to give the mature windbreaks a height profile roughly the shape of a lopsided dome. Naturally, patterns varied in different sections of the six-state belt.

Tall, fast-growing trees

Plains cottonwood. — In many plantings, cottonwood has served well as a windbreak tree. But survival and growth were satisfactory only on lowland sites and on upland terraces where roots could likely reach the water table. Present heights on good sites range from 40 to 60 feet; average height throughout the region is 42 feet. Survival regionwide in 1954 was 41 percent.

Cottonwood is a short-lived species. On the poorer sites, it is already dying out. Loss of the tall trees leaves gaps in the windbreaks and reduces effective height.

American sycamore.—On lowland sites in northern Texas, sycamore did fairly well. Under these favorable conditions, survival was 84 percent and average height was 40 feet. This tree should probably be used more extensively.

White willow.—In North Dakota on favorable sites, willow was superior to cottonwood as a tall, fast-growing tree. Height averaged 40 feet; survival, 93 percent. Willow produced an exceptionally uniform barrier.

Siberian elm.—This species was one of the best, especially on upland sites. Survival of Siberian elm on lowlands was 75 percent; and height, 30 to 50 feet. In the Southern Plains, the recent dry period has killed about half of the elms. Elsewhere in the Plains, the species is doing exceptionally well.

Tall, slower growing trees

American elm, green ash, honey locust, bur oak.—These four species show most promise as tall, slow-growing hardwoods on upland sites. Ash and elm were planted throughout the zone, but honey locust and bur oak were limited to Nebraska and states southward. In spite of its slower growth, bur oak has shown excellent vigor and survival. Ash, elm, and honey locust were effective on all but the shallow soils.

Hackberry, black locust, black walnut, catalpa, Kentucky coffee tree.—These five species were also used in the tall slower growing class, but they did not make a good showing as windbreak trees. Locust, for example, was riddled by borers, sprouted prolifically, and often crowded into adjacent rows of other species. Some of these species, however, grew well under optimum conditions.

Short, fast-growing trees

Box elder, Russian olive, mulberry, osage orange.—These and other species were used in this class, frequently in place of shrubs on the sides of windbreaks. Since these trees tend to open up beneath as they grow older, they fail to give adequate low-level protection. When planted beside rows of conifers, their spreading crowns often suppress and damage valuable pines and red cedars.

Russian olive was planted in all shelterbelt states; box-elder, in Nebraska and the Dakotas; mulberry and osage orange, from Nebraska

southward. Survival and vigor of box elder were excellent. Osage orange withstood adverse conditions on the southern Plains better than other species.

Shrubs

Wild plum, caragana, common lilac, chokeberry, skunkbush.—These five species all proved to be excellent shrubs. Tartarian honeysuckle, tamarisk, and desert willow were also planted but were less satisfactory. Plum makes good low-level barriers, but it spreads by sprouting.

Conifers

Conifer transplants die easily and are slow growing, but once established and with sufficient growing space, make excellent windbreak trees. They offer year-round protection and are more permanent than hardwoods. When the cottonwoods and other tall, fast-growing trees are beginning to die out, the conifers are often just coming into their prime.

Eastern red cedar, ponderosa pine, Austrian pine, Rocky Mountain juniper.—Eastern red cedar proved to be the hardiest conifer, despite suppression by shrubby trees, damage by livestock, sod competition, and dry sites. After they reached an effective height of 12 to 15 feet, even 1 or 2 rows of red cedar made a dense wind barrier. The pines were difficult to get started. But once established, they made excellent windbreak trees. Average survivals were: pine, 42 percent; red cedar, 72 percent; Rocky Mountain juniper, 45 percent. Average heights were: Austrian pine, 17 feet; ponderosa pine, 14 feet; eastern red cedar, 14 feet; and Rocky Mountain juniper, 7 feet. Pines are now outgrowing red cedar.

If better windbreaks are to be grown on the Great Plains, more research is needed. Many difficult problems remain unsolved. We need improved planting stock and new strains specifically adapted to adverse growing conditions. We need to develop methods of maintaining established windbreaks. We need to know more about the influences of windbreaks on wind movement and crop production. We need to find methods to fight off the insects, diseases, and other pests that plague tree plantations on the Plains.

Making trees grow successfully on prairies that Nature assigned to grassland remains a real challenge to American forestry. But the Great Plains Shelterbelt proves that it can be done.

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Tidal Wave of Hardwoods

(*From page* 31)

floated in from nearby seed trees, and young stands of pine began to grow before the heavier seeds of the hardwoods had a chance to invade the area. With the invention of the cotton gin, there came a landclearing boom. This was followed by abandonment of farm land after the Civil War, and again, as a result of the boll weevil, in the early 1920's. The effect of these cycles of land clearing and abandonment resulted in millions of acres of original hardwood forest giving way to pine.

But the forces of Nature exerted their relentless pressure to restore the original area of hardwoods and more besides. Exclusion of wild fires, so essential for successful timber growing, meant hardwood invasion on millions of acres of pine land. Some landowners tempered their fire prevention measures so as to permit use of "prescribed burning" as a means of combatting hardwoods. "Prescribed burning" is the intentional and predetermined use of fire limited to certain areas as a forest management tool. Where used as a hardwood control measure, prescribed burning may not be practiced until the pines are of fire tolerant size. This size varies with species and local conditions. Usually the fires are set in winter when wind and moisture conditions result in a slow burn. The flames are held low by the wind and crawl slowly through the forest destroying underbrush but causing only slight damage to pines. Use of prescribed burning is increasing as its capabilities and limitations become more generally understood.

Important and widespread as it is, hardwood invasion brought about by fire protection is just one of two factors contributing to the hardwood problem. Equally important is improper cutting methods. Indeed, it has been unwise timber harvesting practices which have really let down the bars to hardwoods. All too frequently the main idea of a timber owner is to get the greatest financial return today for his timber. No thought is given to the future. On a large percentage of the South's forest lands, hardwoods, although subordinate to pines, are already present in the forest. Cutting all pine literally makes a present of the land to hardwoods. There is nothing insidious in this change. Before logging, the forest consists of mixed pines and hardwoods. After logging, it consists of pure hardwoods, see Figure 5.

And so the present day pine forests of the South bear witness both to Nature's successful efforts assisting hardwoods to take over pine land and to unwise pine harvesting methods dating back for generations. Consequently, on the greater percentage of pine land in the South, unwanted hardwoods have either taken definite hold or else are present in sufficient quantities to do so when the existing pine is removed.

The problem of hardwoods taking over pine land may not be considered serious, of course, unless it results in an actual shortage of pine timber. After all, the 193 million acres of forest land in the South could be adequate to grow far more than the 45 million cords of pine which represent the approximate current annual use by industry. But are they adequate?

Of the South's forest land, pine types comprise 103½ million acres, according to the Forest Survey. However, this figure includes 20½ million acres of oak-pine type. On this considerable acreage pines comprise less than 50 percent of the volume. This, then, leaves 83 million acres of true pine forest—a forest from which nearly 20 percent of the nation's softwood lumber and nearly 60 percent of the long fibre pulpwood is harvested. Of the 83 million acres of pure pine type, at least 25 million acres are on sites of lower than average growth capacity, for example, the sandy lands of a large portion of Florida and the mountainous portions of several states. Lastly, an estimated 15 million acres of the South's pine land is either bare or inadequately stocked. Many years must pass before this acreage will produce at near capacity, even if a program towards this objective were undertaken at once.

When these several deductions are applied to the total acreage of pine forest land in the South, the net figure left is 43 million acres. On this acreage the bulk of the pine for industrial use must be grown. Of course, this will be supplemented to some extent by growth of pine in mixed forests of hardwood as well as in the pine stands in which growing conditions are below average, men-

tioned in the preceding paragraph. The Timber Resources Review revealed an industrial use of 42 million cords of softwood (less than 3 percent of cypress, red cedar and other minor species) for 1952 as compared with a net growth of 47 million cords. Now the 1956 pulpwood consumption was 4 million cords more than in 1952, and a recent report by a Congressional Committee on the Pulp, Paper and Board Supply-Demand indicates that a tremendous increase in pulpwood consumption is anticipated in the immediate future. According to this report, the 1965 demand will be 47 percent greater than the 1956 consumption. If this prediction is correct, the 1965 pine use for all purposes may exceed 50 million cords. Although net pine growth should equal this volume by that date, it is unlikely that growth will exceed use by more than a narrow margin. The time has not yet arrived when the South can afford to share its pine land with unwanted hardwoods.

From these considerations it is evident that further inroads by hardwoods on the South's pine forests is dangerous. No other word suffices.

Why doesn't industry use the hardwoods? To begin with, hardwoods found on pine lands are too small or defective for any major industrial use except pulp manufacture. Their use for paper is definitely limited by their fibre characteristics. Pine fibres are long and highly suitable for making strong paper. Hardwood fibres, being short, result in low strength paper. And, whereas the strong fibres from southern pines are ideal for manufacture of wrapping papers and heavier grades, southern hardwood fibres are no better than those from hardwoods in any other section of the country. Lastly, the rest of the nation, in short supply of long fibre woods, has an abundant supply of short fibre hardwood.

Furthermore, the quantity of hardwoods in the South available for pulping simply staggers the imagination. Not only are there cords by the ten millions growing on uplands, but there are even greater quantities growing in bottomlands on hardwood sites. Indeed, although the South is best known as "the land of pine," more than half of both its wood volume and forest area are hardwood. Then, too, cull hardwood trees for which there is no known or readily conceivable current industrial use, occupy the prodigious total of some 45 million acres of land! This is equal to one-fourth the South's total acreage in forest.

Clearly the solution of the hardwood problem is not one of utilization, not in the immediate future at least. The only alternative is a program of control by eradication. This program has its complications, one of the most important being that hardwoods play an important role in providing food and shelter for certain forms of wildlife. Conservation groups throughout the South are showing considerable apprehension of hardwood control programs lest such programs have a detrimental effect on the game supply. Suffice to say that no one has such plans. Even if they did, their effectuation would be impossible. Already mentioned is the fact that in area hardwood forests exceed pine. On the millions of acres of good hardwood land, removal of the hardwoods so as to grow pine would be sheer folly. On the other hand, removal of non-merchantable hardwoods crowding out pine on good pine sites is sound business and can hardly be conceived to exert more than a minor influence on game for two reasons. First, large landowners and most foresters encourage the

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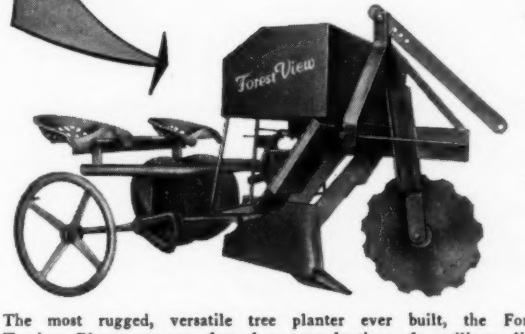

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American Forests Reprint Record Helps to Boost Service; Compton Defines AFA Aims

SALE of over 250,000 reprints of articles published by AMERICAN FORESTS in 1957 is an all-time record and has helped the association to boost its service to the general public, the editors announced last month. The Big Four sellers that topped all other articles published during the year in reprint orders were: A Marketing Primer for Woodlot Owners, 105,000; Forestry As a Career (reprint of an entire issue), 40,000; Making a Watershed Work, 24,000; and A Woodlot Primer, 15,000. These reprints were distributed by interested groups and agencies to woodland owners, schools, watershed programs and a variety of other interests.

In speaking of AFA's Program for American Forestry at Madison, Wisconsin, Vice President Wilson Compton said, "If this association were doing no more than to provide an orderly forum, available alike to foresters, forest owners, forest industries, conservationists and other public-spirited citizens, and to public and private forest agencies, for the consideration of common problems and opportunities it would warrant generous support. But it is doing, and with our help, can continue to do more than that. This association, like other non-political conservation organizations represents deliberate *voluntary public and private cooperation.* This is a unique characteristic of American life, envied if not copied in other and older countries. The alternative is a gradual extension of the functions of government. If we prefer to deal with our problems as scientific, economic and educational and not as dominantly political we had better fortify our means of *voluntary* public and private cooperation. If we doubt this, we need only to look at the world about us.

"Forest conservation—including permanent productive use of forest land and economic utilization of forest products—is of course important to lovers of trees, waters and wildlife. But it is much more than that. It is a part of our national progress and indeed of our national defense. Our national security is not separable from our national industrial might; and this in turn is not separable from the conservation of the resources—including the forest resources—on which that industrial might is built.

"These facts are in the background of the Program for American Forestry to the promotion of which this association is committed. The association itself is a means to an end, not an end in itself. As we consider practical steps to advance this program, I hope we may know that fundamentally we are seeking not to strengthen an organization but to strengthen a nation."

E. W. Tinker, APPA Executive

EARL Warren Tinker, who for the past 18 years served as executive secretary of the American Paper and Pulp Association, died August 31.

During his years of distinguished service to the pulp and paper industry the name of "Ted" Tinker and the American Paper and Pulp Association became synonymous, as the work of the association under his leadership kept pace with the rapid growth of the industry it represents.

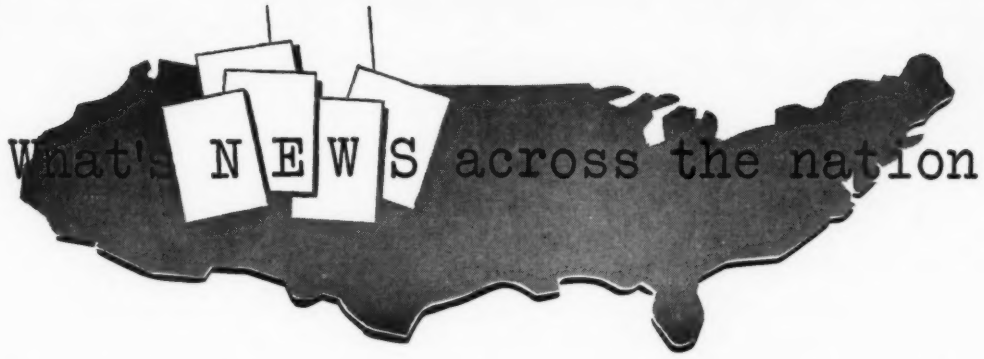
Prior to his joining the paper industry, however, Mr. Tinker had a long career with the Forest Service, which he entered in 1915 as Forest Assistant in the Black Hills of South Dakota. His abilities and dedication to the concepts of sound forestry and conservation practices received increasing recognition as he rose through a series of varied assignments to the post of assistant chief of the Forest Service in 1936. Upon his appointment as executive secretary of APPA in 1940, he was able to carry over into private industry his efforts to strengthen our forest resources.

leaving of certain hardwoods as a source of feed or for den trees. Second, vast unbroken expanses of pine forests are rare. Commonly pine forests are interspersed with hardwood lands in the form of swamps, bays, or water courses. Removal of hardwood from such sites is not countenanced by land managers and these sources of game food and shelter will be unaffected by hardwood control measures.

It is not the purpose of this paper to discuss the techniques for hardwood control, of which there are many. These involve deadening with tools either with or without supplemental use of poisons, spraying with chemicals from the ground and from helicopter, and removal by heavy earth moving type machinery. All are costly. None assures complete elimination of unwanted species. Several methods assure temporary riddance of hardwoods providing a period during which a new crop of pines may be established. Although many paper companies have boldly embarked on programs of hardwood control on their own land, the relatively small percentage of forest land in their ownership, less than 8 percent of the total, precludes at best any hope of more than partial solution of the problem. On the national forests, control of hardwoods on a good many thousand acres, after allowing for needs of game for food and shelter, has given pines a new lease on life.

Under the Agricultural Conservation Program payments are made for Timber Stand Improvement whereby hardwoods are removed. Landowners have carried out these practices on a substantial acreage. Every effort should be made to encourage this program, especially by small private owners, who in the aggregate own 66 percent of the South's forest land. Unfortunately, a majority of landowners still need further selling on the general subject of Tree Farming.

Encouraging as these control measures are, it is evident that a significant regionwide program of hardwood control is very distant. In the meantime, through invasion and through release after removal of pine, hardwoods continue their march of dominance. As a result, although hardwood control is currently being practiced on tens of thousands of acres, the area of pine land annually being taken over by hardwoods is measured in hundreds of thousands.



BUTTON UP YOUR OVERCOAT—The "Old Farmer's Almanac" says that this winter's weather will be "ferly and surly—a real humdinger." Predictions for the rest of December: 13-16—Mid-West frigid, storms in the East; 17-24—cold; 22-24—Florida cool; 25—cold; 26-31—colder and snow. Cow's coats real thick we observed last month in Vermont . . . another sure sign of a cold winter, some people think.

PROF. BILL ADAMS, OF THE UNIVERSITY OF VERMONT, concerned over widespread use of insecticides we learned in traveling on the bus with him from Middlebury to Syracuse for the society meeting. There are far too many unanswered questions about the use of these poisons, especially the arsenics, he feels. For instance, what does arsenic do to the soil in areas where chemical debarking is practiced, he asks? Use of chips as fertilizer may also be suspect, he thinks, for tannin in bark is injurious to some forms of growth. Did you ever see seedlings growing in sawdust, he asked further. There are many, many questions that should and must be answered regarding these problems, Prof. Adams insists.

DR. FAIRFIELD OSBORN, PRESIDENT OF THE CONSERVATION FOUNDATION, must have heard Prof. Adams talking for he raised some of these same questions in his address to the foresters. "I would like to voice the apprehension felt in many quarters concerning the present and growing practice of the widespread spraying of pesticides from airplanes aimed at controlling insect infestations such as gypsy moth, the budworm and so forth. This apprehension stems, as you know, from the evident severe damage done to the biotic environment, especially birds, fish and many lower forms of animal life as a consequence of this mass poisoning. . . Of course, we all recognize that there are economic advantages which presumably are the result of pest control. We, together with everybody else, have to admit, however, that not enough is yet known concerning the long-term effects of widespread pesticide controls. There are those who doubt that even from the point of view of the forests themselves, the great expenditures that are being made in this direction are justified and actually succeed in their objectives except on a temporary basis. A tremendous amount of research is needed on this subject and it would be of very great value if your national society could to a greater degree focus its attention upon the pros and cons of this question."

AFA's FORESTRY CAREER REPRINT was mentioned in three different addresses at the recent meeting of the Society of American Foresters at Syracuse. Prof. Floyd E. Carlson, of Syracuse University, said "Public relations has been defined as the art of bringing about better public understanding, which breeds greater public confidence for any individual or organization. As we scan the forestry horizon today it is heartening to discover that there are numerous instances of this art being applied . . . regarding the profession and opportunities in forestry. . . For example, the special effort put forth by The American Forestry Association to 'fill up the forestry schools' is in my opinion outstanding, and a splendid contribution to the profession." This reprint, which was made possible due to the cooperation of both the society and the Old Dominion Foundation, has now gone to 28,000 high schools in the country and to all installations of the United States Marines. Inquiries are rolling in from all over the world.

DR. RALPH HOSMER, 83, A CHARTER MEMBER OF THE SOCIETY and a member of The American Forestry Association since 1891, was given a big hand by foresters when introduced at Syracuse. He reported that Royal S. Kellogg, William L. Hall and himself—all charter members—"are in reasonably good condition and have every intention of attending the 60th anniversary of the society in Washington several years hence." Mr. Kellogg attended the AFA meeting in Wisconsin but did not get to Syracuse this year.

(Turn to next page)

THE PROSPECT OF "MORE AND MORE HUNTERS AND FEWER OPPORTUNITIES TO HUNT" as reported by Edward L. Kozicky, of the Conservation Department of the Olin Mathieson Chemical Corporation, was given headline treatment by Syracuse newspapers. An increase in fee hunting was predicted by Mr. Kozicky.

HENRY CLEPPER, SECRETARY OF THE SOCIETY OF AMERICAN FORESTERS, writes from Rome, Italy, that he will do an article for American Forests on the ninth conference of F.A.O. which started on November 2 and closes November 23. With him are Forest Service Chief R. E. McArdle, and Dr. Verne L. Harper, of the Forest Service. Plans are being made there for the forthcoming World Forest Congress in Seattle in 1960. Meanwhile, the society meeting at Syracuse got the plans for the Congress off to a good start with its International Night Program that featured the songs and dances of a number of foreign countries. In fact, the program was so good that Lewis M. Turner, Dean, College of Forest, Range and Wildlife Management, Utah State University, in charge of the program for next year's meeting at Salt Lake City, is already worrying how he can top it.

Forestry Receives $40,000 Grant

(*From page* 24)

point of view of the forests themselves, the great expenditures that are being made in this direction are justified and actually succeed in their objectives on a temporary basis."

Dr. Osborn's comments were heard sympathetically by a number of research men in forestry who say management has gone "too fast and furiously" with the use of poisons, particularly the arsenics, before all avenues had been thoroughly explored. Management men, on the other hand, were less sympathetic with some of them maintaining that they "are paid off on results, not on theory."

Coinciding with the society's meeting at Syracuse was the annual convention of the National Audubon Society in New York City where Dr. Paul Sears, of the Yale University Conservation Program, said, "science's basic job, without any gloss, is to give us the picture (in pesticide hazards) right side up." Audubon delegates heard that the toxic effects of DDT might last five to seven years and that at least 500 newer and more lethal pesticides are being developed but that "no one seems to know just what their properties are."

In reference to world population, Dr. Osborn said there are just too many people and "one is forced to the conclusion that the only real remedy is the stabilizing of populations. Fortunately, there is increasing realization that this must be accomplished and already three governments — Japan, India and Communist China — are taking positive steps toward this end."

One hard fact is that every 75 days there are eight million more people on earth, a figure equivalent to the entire population of New York City, Dr. Osborn said. And while there are other causes, population pressures are a principal factor in bringing on wars.

Dr. Osborn raised these questions in view of the fact "we can come to no judgment, sound or otherwise, unless we give the subject some thought." This we have not yet begun to do, he said.

Dr. Osborn's population comments were received with much interest by foresters who are having to grapple with population pressures on their own forest lands. According to veteran foresters, professional interest in recreation and wildlife management was more pronounced at Syracuse than at previous meetings. An address by Edward L. Kozicky, forester for the Olin Mathieson Chemical Corporation, stressed that the prospect is more hunters with fewer and fewer opportunities to hunt. Special interest was shown in the report by Edward P. Cliff, Forest Service assistant chief, on the activation of "Operation Outdoors." While plans were started last year to double present picnic and camping facilities on national forests, Sputnik may prove a bottleneck as regards activating the wildlife phase of the program, he said.

A Bushel a Buck

(*From page* 21)

cal cutover aspen stand, therefore, provides the varied, nutritious food needed by the whitetail.

A certain amount of browsing on aspen by whitetails does no harm. But browsing in a big way by hungry deer is another matter. A young tree is stripped of its leaves and small branches. As a result it becomes stunted or dies, and all those associated with the plant and animal community are the losers.

The browse line, the limit to which a deer can reach for food, indicates an exhausted food supply. When the last food within reach of a deer is eaten, the animal usually starves. And overbrowsing of new aspen stands prevents the development of future deer food and also the development of timber to meet the needs of the paper industry.

A partial solution for the problem of too many deer eating too much browse lies in a combination of forest and herd management.

The type of aspen management advocated by the paper industry is geared to increase the food supply for deer. It is a program to assure a continuous supply of aspen. This makes it necessary to have stands of these trees in various stages of development, so that there can be a harvest each year.

Once the out-of-reach trees, the mature aspens, are harvested, new trees spring up from the root systems encircling the stumps. Now, food is within reach of the deer. The leftover green tops from the harvested trees provide additional browse during winter—a time when the deer need it most. And the periodi-

cal thinning of an aspen stand is also another source of food.

Proper management of the aspen stands and the subsequent harvesting must be backed up by the proper management of the deer herds. On the Lower Peninsula where some areas have as many as 80 to 100 whitetails to a square mile, there is little or no woody vegetation. In other areas 15 to 20 common plants are missing due to deer browsing.

The lack of woody vegetation and the absence of plants indigenous to an area disturb Nature's setup of the floral community. The effects may show up in the near future, the next tree generation, or in the distant future, 200 to 300 years from now.

Management of the whitetails in the woods of lower Michigan, and in other areas where they are a problem, should include flexible game laws. Conservation commissions should be permitted, whenever necessary, to extend seasons and to rescind the "buck-only rule."

After the big winter die-off of whitetails in 1951, Michigan's Department of Conservation got approval for an "either-sex season" on deer. This season was for 3 days and lasted for 3 years. And during those 3 years no deaths from starvation were reported.

In 1955 more than 70,000 whitetails were killed by hunters in Michigan, and the kill for the entire country was more than 600,000. Probably, this was only a fraction of the numbers that could and should have been killed.

A reduction in the size of the whitetail herds in lower Michigan, as well as throughout the rest of the country, is desirable. The sportsman, the farmer, and the paper industry all stand to benefit, if the deer are brought to a little below the carrying capacity of their ranges. For when the animals are uncrowded, individual deer are larger and stronger, and herds produce larger annual crops of fawns. By reducing their numbers, crop depredation (a costly problem in some areas) is lessened. And with fewer deer the aspen forest type stands a chance of survival, too, and so does the industry that depends upon it.

According to *Michigan Wildlife*, September 1955, the handling of aspen lands so as to benefit the deer herd and at the same time produce valuable forest products is possible with the cooperative effort of public agencies, forest industry, and sportsmen's groups.

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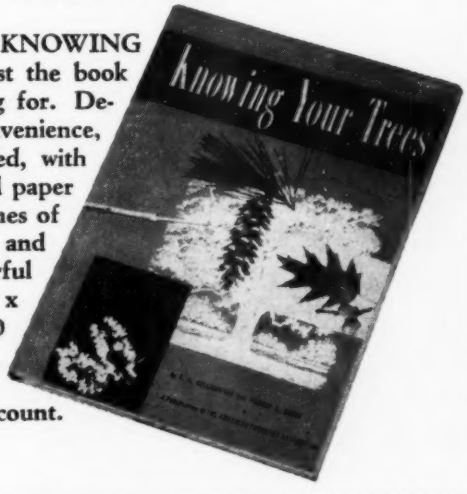

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Feature Photo of the Month

Photos used on this page will be of unusual rather than esthetic qualities and subject matter will be restricted to scenes, events, objects or persons related to the use, enjoyment or unique aspects of our renewable natural resources. For each picture selected AMERICAN FORESTS *will pay $10*

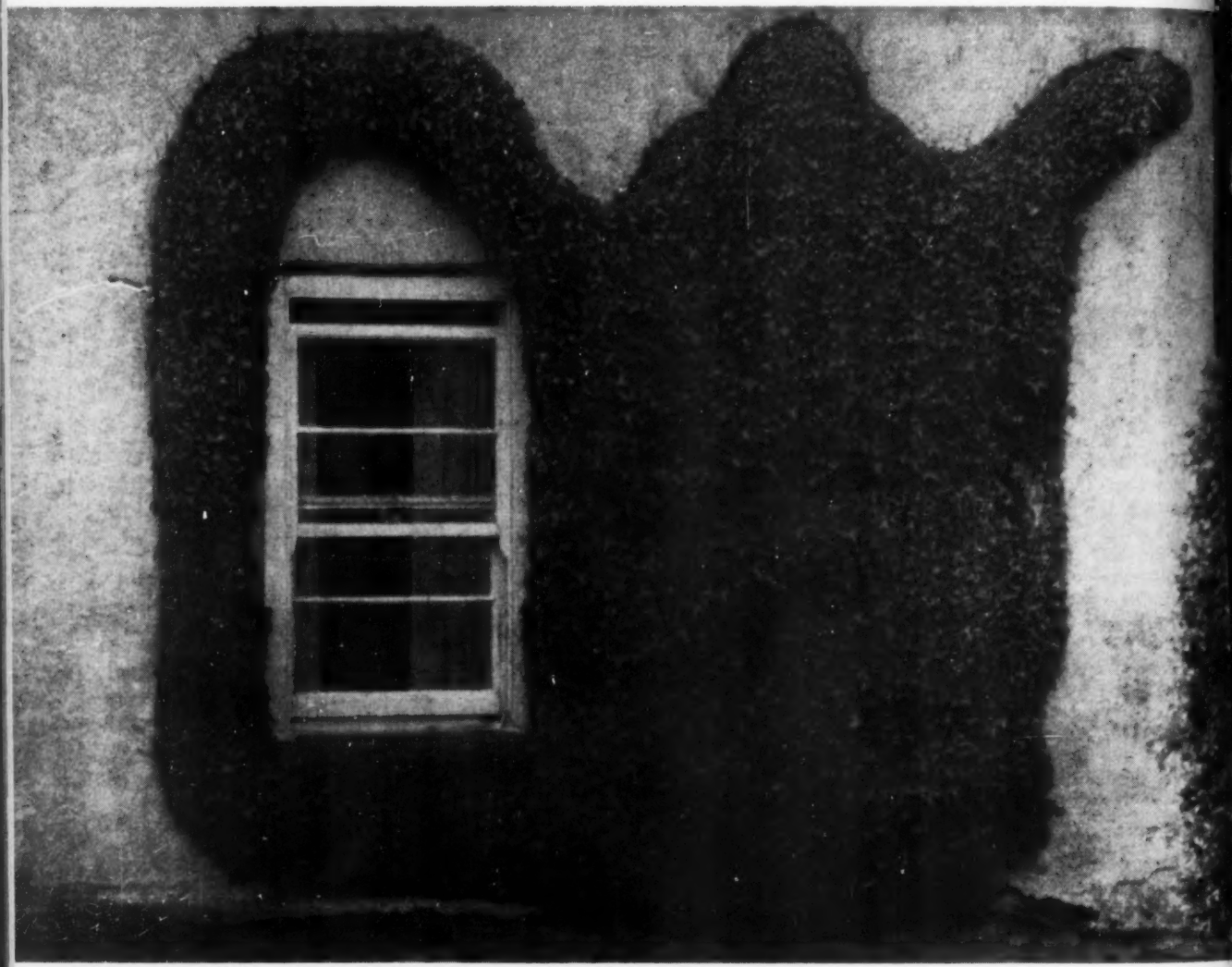

Photo submitted by E. V. Malone, Downpatrick, County Down, Northern Ireland

This huge teapot of small-leaved ivy is growing on the front of a cottage near the village of Dundonald on the outskirts of Belfast in Northern Ireland. It was fashioned in this unusual shape about 50 years ago, and the present tenant, Mr. Alexander Moore, keeps it in trim. As there is no official address for the cottage, Mr. Moore receives many letters addressed: "The Teapot Cottage," Dundonald, Northern Ireland.

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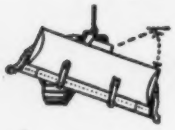

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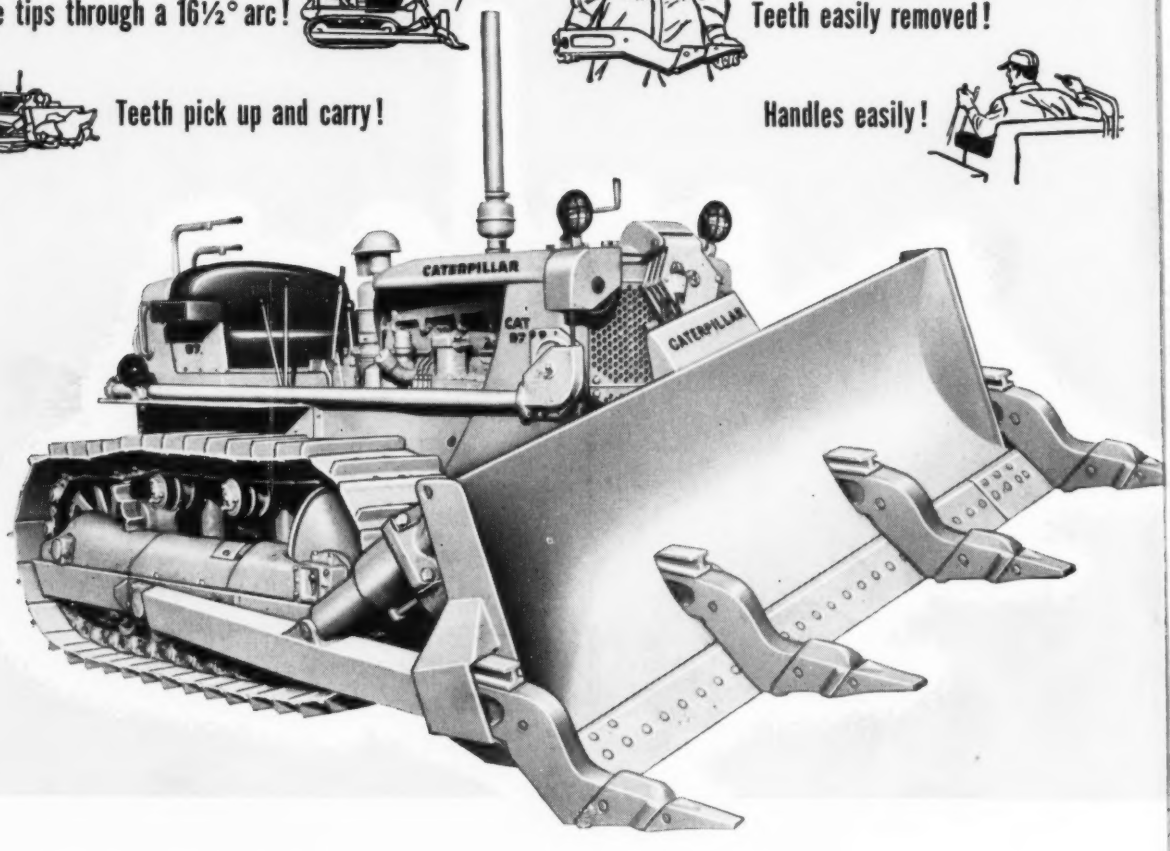

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